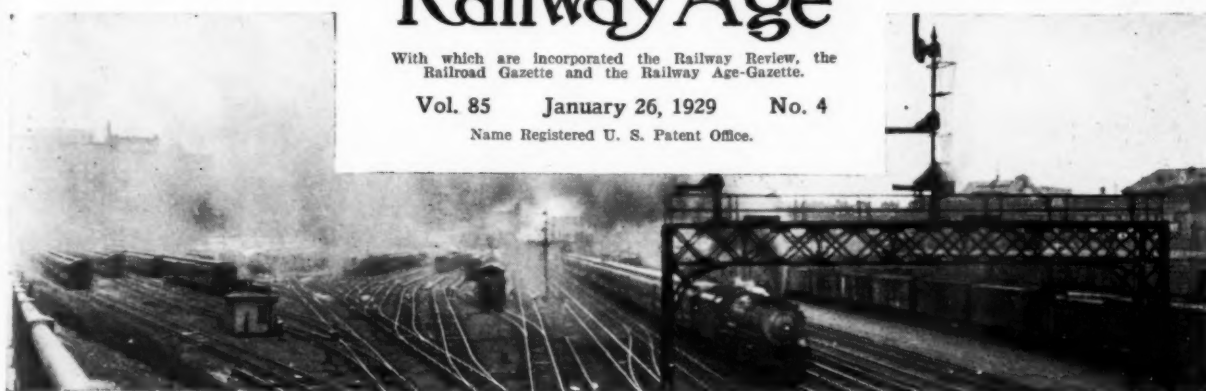


Railway Age

With which are incorporated the Railway Review, the
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Vol. 85 January 26, 1929 No. 4

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Boston Section of "Twentieth Century Limited" Leaving Boston on the B. & A.

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Railway Age

Vol. 80, No. 4

January 26, 1929

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Too Many Bosses

"IT would take more than an advance in pay to make the position of section foremen attractive to men of greater ability than that possessed by the average foremen in the service today," is the opinion recently expressed by a middle-western maintenance of way officer. "So long as they are at the beck and call of almost everyone on the property," he added, "we will be unable to get better men by paying better wages." That the foreman has a real grievance on this score is recognized by roadmasters and supervisors, but there is little that they can do about it, for on most roads the foreman and his gang are at the call of the station agent to scrub floors, wash windows or load freight, and almost any operating officer, from the assistant superintendent up, feels free to give him explicit instructions covering almost any detail of work for which he is presumed to be accountable to his direct superior, the roadmaster or supervisor. To employ section forces on certain work incidental to station service, is probably the best solution of a perplexing problem, but for a superintendent to give orders to every foreman he meets on a motor-car trip over his division, not only confuses and discourages the foreman, but interferes unnecessarily with the efforts being made by the supervisor to direct the work of his section crews in accordance with a systematic plan. The wise supervisory officer will encourage initiative and enterprise on the part of his foremen by giving them as much freedom of action as he can, taking into account their individual limitations and characteristics, but the pursuance of this policy is nullified if others interfere.

Trends in Highway Policy of British Roads

TRENDS of development in British railway policy with reference to motor coach operation, under the recently acquired Parliamentary authority to operate upon the highways, are indicated in the new year message of Sir Ralph Wedgwood, chairman of the General Managers' Conference of the Railway Clearing House. After discussing various innovations in reduced-rate travel facilities by which the British railways, during 1928, sought to check passenger traffic losses, the statement continues to say, "the railway road policy itself is being steadily developed. Railway omnibus services are being opened up in different parts of the country, but there is not, and with reasonable counsels on both sides there will not be, any all-round attack on the omnibus interests. The railway companies are discussing problems of co-ordination and partnership with existing road transport companies. We hope to see the establishment of joint services which will give the public fuller facilities than they have ever had before, with through bookings and opportunities for traveling by

road or rail according to choice, and readier means of transferring from one method of conveyance to another. There is no doubt that before many months have passed the railway companies will be very much more fully represented on the roads than they have been hitherto." The foregoing statement, coupled with the recent announcement that the Great Western has combined with an independent operator in the formation of a joint holding company to conduct motor transport operations, would seem to indicate that the policy of the British railways, in the exercise of their highway powers, will be, so far as it may be expedient, one seeking co-operative agreements or consolidations with independents already in the field.

Railroad Purchase of Extensive Independent Motor Coach Lines

IN the Motor Transport Section, published with this issue of the *Railway Age*, announcement is made of the acquisition by the Southern Pacific of two important independent highway motor coach operations and the purchase by the Pennsylvania of a substantial interest in three large motor coach operations heretofore controlled exclusively by the Mitten rapid transit interests of Philadelphia. The Pennsylvania states further that this is but the first step in the complete co-ordination of rail and motor coach service which will be extended to include its entire system. The company, through its highway subsidiary, will establish many motor coach lines of its own, and will purchase or enter into operating agreements with existing lines. Motor coach service will be made to work hand-in-glove with train service and journeys made part by rail and part by highway will be facilitated. The importance of an announcement of this kind by one of the very largest railroad systems in the country is manifest. The conception of a great railroad as not merely a rail line but rather as an all-round transportation company is gaining headway and the action of the Pennsylvania should give it further impetus. It is also significant that, while the company plans the substitution of motor coaches for trains as a measure of economy in some instances, nevertheless one of the guiding motives behind the plan is "to encourage the continued development of the company's general passenger traffic." The motor coach, then, is not to be an enemy of rail passenger service, but an aid to it. This has already been the result on one railroad—the New Haven—which has blanketed its whole territory with motor coach lines. Is there any reason why the policy ought not to work equally well with the Pennsylvania? With such rapid development in railway adoption of the motor coach as the past few months have seen, it seems entirely possible that the railroads have passed through the darkest hour of the passenger traffic situation and that the dawn of a satisfactory solution is near.

British Railways Extend Public Relations Work

WITH the opening of 1929 a committee of the British Railway Clearing House, designated the "Advertising and Public Relations Committee," has commenced publication of a monthly bulletin entitled "Railway Newsletter." The publication consists of two pages, similar in style to "Railroad Data," which is issued weekly in this country by the Committee on Public Relations of the Eastern Railroads. The function of the British publication, as stated in connection with the issuance of the January number, is to "give an idea of the railways as they are and of the services they are rendering, and wish to continue to render, to the transport needs of the country." This initial issue contains a new year message from the chairman of the General Managers' Conference of the Railway Clearing House, together with other brief statements from railway officers and additional items which are concerned with non-technical explanations of railway operations, developments and innovations. The desirability of effective public relations activities to present the railway point of view in its proper perspective and the advantages of the consequent favorable public attitude on railway questions has long been recognized in this country. Here is evidence of a greater recognition of these factors by English railway officers in this adaptation to their use of the plan of those American roads which co-operate in the publication of the familiar "Railroad Data."

Possibilities for Utilization of Modern Locomotives

IN discussions of modern locomotives so much has been said concerning their capacity-increasing ability that in much of the thinking on this subject the term "modern locomotive" is immediately assumed to apply to the locomotive which is designed primarily to meet heavy main-line conditions where increased train load or increased speed with heavy tonnage trains are the principal operating objectives. Where main-line traffic conditions are such that increased tonnages and speeds are desirable, the greatest return on an investment in modern motive power is undoubtedly obtained. Such conditions, however, by no means exhaust the possibilities for the utilization of modern locomotives. Since 1920 traffic increases have been relatively small as compared with the average annual increases which obtained prior to the war. The possibilities for increasing net railway operating income as the result of increasing traffic volume are, therefore, much more limited than before the war and it is becoming increasingly evident that more and more dependence must be placed on increasing efficiency by refinements in directions which do not depend primarily on increased train loads. In this respect the efficiency factors of modern locomotives, irrespective of their size and tonnage capacity, offer a large field for improvement which has not yet been extensively utilized. This applies to some extent to main-line operation where conditions do not warrant extensive increases in train loading; to secondary lines where train loading is more or less limited by service requirements, and to switching service. From now on more and more attention will need to be given to the possibilities for economy of modern locomotives in these services.

Commissioner Meyer on the Hoch-Smith Resolution

THE remarks regarding the Hoch-Smith resolution made by Commissioner B. H. Meyer of the Interstate Commerce Commission, at the annual dinner of the Milwaukee Traffic Club last week, should be carefully read and pondered by everybody who has any desire to see railway rates made fairly and intelligently. In his address, a summary of which was published in the *Railway Age* of January 19, Doctor Meyer did not criticize the Hoch-Smith resolution. He merely interpreted it and indicated what four years of experience under it shows the commission must do to carry it out. And yet, although he did not intend to do so, he drew the most terrific indictment of the Hoch-Smith resolution and of Congress for passing it that has come from any source. His address affords a startling indication of the effects that may reasonably be expected to be produced when Congress, without full investigation and consideration, interferes with the performance of functions which have been delegated to the commission and which can be safely and satisfactorily performed only by a body which is impartial, possesses special knowledge, and is uninfluenced by political considerations.

The Hoch-Smith resolution undoubtedly was intended by those responsible for its passage to cause the commission to make a readjustment of freight rates only for the benefit of agriculture. Some of the ablest and fairest leaders of agriculture have said that it was not their desire or expectation even to get preferential treatment for products of agriculture—that all they wanted was an investigation to determine whether existing freight rates discriminated against agriculture, and, if so, such readjustments as would result in relatively as low rates on farm products as on other commodities. Whatever may have been the intention, the provisions actually put into the resolution do not call merely for such readjustments of rates as may be reasonably made to help agriculture. They call for a revolution in the entire freight rate structure and rate-making policy of the nation.

The resolution, Doctor Meyer said, "attempts to make the railroads in the United States the shock absorber and balance wheel for the entire economic life of the country to the extent to which this may be accomplished through the instrumentality of railroad rates."

Considering "Conditions in the Various Industries"

The most revolutionary provision is that in which it is "declared to be the true policy in rate making to be pursued by the Interstate Commerce Commission in adjusting freight rates that the conditions which at any given time prevail in our several industries should be considered." As Doctor Meyer said, "Here we have a general legislative mandate which it not confined to a limited group of commodities, but it embraces all commodities." He added elsewhere, "In order to apply fully the ideas of the resolution we should be informed at any given period of time with respect to the degree of prosperity or the lack of it of every single enterprise in this great country in order that we may intelligently lift burdens off those shoulders which are less able to bear them and place them on the shoulders of those that are more able to bear them in so far as these burdens are affected by charges for transportation."

The *Railway Age* repeatedly has declared that the

resolution provides for regulation of the profits of every industry by a continuous process of reducing the rates of those that are depressed and advancing the rates of those that are prosperous. This interpretation has been controverted. The commission must interpret the resolution in order to apply it. It is not at all probable that any member of the commission would make the address that Doctor Meyer did without having previously submitted it to his colleagues. There can be little question therefore that the statement made by Doctor Meyer means that the commission understands the resolution to direct it to so regulate freight rates as to regulate profits in all the country's industries.

Doctor Meyer made some observations which show he is fully aware of the difficulties that will be encountered in carrying out such a policy. "It is generally easy," he said, "to suggest reconstruction of the rate structure through reductions in rates, but I have yet to see the first body of volunteers to advocate reconstruction of the rate structure by increasing rates on commodities represented by that body. I have seen regiments ready to propose increases in rates of commodities shipped by someone else." But "under the mandate of the Hoch-Smith resolution when the economic condition of an industry changes, the rates affecting that industry should be changed. Theoretically, at least, this means an increase in rates during prosperity and a reduction during adversity."

Keeping A Hundred Solomons Busy

How much of a task will it be to regulate rates in this way? Industries that are prosperous are always becoming unprosperous. Industries that are depressed are always becoming prosperous. Therefore, there could never be any cessation of the commission's readjustments of rates on account of the conditions existing in the various industries. "I could keep a hundred Solomons busy on this program for a hundred years," said Doctor Meyer. His statement was too conservative. At the end of the hundred years there would still be some industries that were prosperous and some that were depressed, and the hundred Solomons would still have before them in as acute a form as ever the problem of adjusting freight rates in accordance with the conditions existing in the various industries.

What is the difference between this policy of rate regulation and the policy it was understood was required by the Act to Regulate Commerce before the Hoch-Smith resolution was passed? The commission then tried to adjust rates mainly in accordance with transportation conditions. It considered the approximate cost of transporting the various commodities, and the rates that they could bear as indicated chiefly by their value. It considered transportation and market competition. It considered the return the railways should be allowed to earn. Even then the regulation of rates involved the hearing and decision of so many cases and the solution of so many problems that the commission found it extremely difficult to meet the demands made upon it. Now it must ascertain and consider, not only the rates the traffic can bear, but the rates the shippers of the traffic can afford to pay. Suppose that, measured by the cost of transporting certain commodities and their value, there is no reason for reducing the rates upon them, but that the industry which produces them is depressed. Then, under the Hoch-Smith resolution, the rates upon the commodities should be reduced, although, as measured by the standards always heretofore accepted, they are not excessive and not a cause of the industry's depression. Likewise, the

rates charged some other industry, as measured by all heretofore accepted standards, may not be too low, but they must be advanced any way because the industry is prosperous. How is the commission to determine what is the condition of adversity or prosperity of every industry in the country? It can only do so, as Doctor Meyer intimated, by constantly conducting an inquisition into all of the business of the country in order that it may "be informed at any given period of time with respect to the degree of prosperity or the lack of it of every single enterprise in this great country."

Of course, it is an absolute impossibility for any body composed of human beings to more than partially carry out the Hoch-Smith resolution as interpreted by Doctor Meyer, and nobody who understood it as thus interpreted would want it carried out. Why were provisions so revolutionary put into it? Because those who wrote it knew almost nothing about the railway rate structure of the country or the principles that had been and should be applied in making rates. Why was it passed? Simply to throw a political sop to the farmers. And these two questions and answers summarize the entire case against congressional interference with railway regulation. Congress does not know enough about transportation matters directly to regulate them, and even if it did it is so influenced by political considerations that a policy laid down by it is almost certain to be intended to accomplish political purposes and therefore to be unfitted to furthering the economic welfare of the country.

Another Railway Competitor?

MUCH attention has been paid in recent years to the newer forms of competition which the steam railways have had to face, notably the private automobile, the bus and the motor truck. Now the airplane bids fair to become a passenger carrying competitor. That this is not the end of the long list of railway competitors, is indicated by the comments of two railway executives as published in the *Railway Age* annual statistical issue, for it is there pointed out that the rapid extension of huge interconnected electric power systems has, in part, been responsible for the failure of railway coal traffic to increase as anticipated. Recent statistics relative to the decrease in industrial coal consumption, because of the increasing centralization of power production and distribution in the electric utility field, show that a reduction of 40,000,000 tons a year has been effected. This is based upon a comparison of 1927 consumption with what would have been consumed had the same power output been generated in plants having the overall efficiency of those in operation ten years ago.

Again, much coal is now shipped direct from the mines to large nearby central power stations, rather than to power houses of industrial plants at more remote locations, with the result that the average haul per ton of industrial coal has been reduced. Greater freedom of location because of the long distance transmission of electric power has enabled industrial executives to locate their operations closer to sources of raw materials and their markets. Taken together, these three factors have tended to reduce the ton-miles of coal traffic below the amount which might otherwise be expected, owing to the increase in population and in the level of general commercial and industrial activity.

This tendency will undoubtedly continue, because electric power consumption since 1914 has increased

more than 25 times faster than population. The latter is about 25 per cent greater than 15 years ago, but power consumed is roughly 650 per cent greater. It is estimated that 75 per cent of the manufacturing plants in the United States are electrified, two-thirds of the power used being purchased from interconnected utility systems. The amount of power per worker in industry has doubled during the 15-year period. The amount of power transmitted across state lines represents 9.6 per cent of the total generated and more than half of this amount is accounted for by nine large utility systems. It is only reasonable to suppose that the interchange of power across state boundaries will increase rapidly as the art of electric power transmission and inter connection advances.

Growth of Railway Traffic

MORE efforts are being made to divert traffic from the railways now than ever before. All of these efforts include expenditures by the national and state governments to foster the development of competing means of transportation. When these projects for subsidizing competition with the railways are discussed their advocates always are profuse in giving assurances that there is no intention of injuring the railways and that there will always be plenty of traffic for them. The principal ways in which public money is being and is to be spent to aid competing means of transportation are, of course, by the construction and maintenance of inland waterways and highways.

In view of all that is being said, done and proposed affecting railway traffic, it is worth while to review the trends of that traffic during recent periods of years. It is well known that, owing to the greatly increased use of motor vehicles on highways, the railways since 1920 have lost one-third of their passenger business and are now handling the smallest amount of passenger traffic since 1909. Few people realize, however, the extent to which the growth of railway freight business has diminished. Complete traffic statistics for 1928 are not yet available, but those that are available indicate that the freight business handled was almost exactly the same as in 1927. Let us see, then, how the freight business handled by the railways has increased during the five periods of five years each during the last 25 years.

The increase in the five years ending with June 30, 1908, was 45 billion ton-miles, and in the five years ending with June 30, 1913, it was 84 billion ton-miles. During the 5½ years ending with December 31, 1918, it was 87 billion ton-miles. It is usually assumed that freight business was stimulated by the war, but these figures show that the increase during the war years was relatively no greater than immediately before. In the five years from 1918 to 1923 the increase was only 7 billion ton-miles, and in the five years ending with 1928 it was only 17 billion ton-miles. It will be noted that the increase during the last five years was only about one-fifth as great as it was during the five years ending with 1913 and the five and one-half years ending with 1918.

To state to just what extent this striking decline in the rate of growth of railway freight business has been due to the competition of other means of transportation, and to what extent to other causes, is impossible. That the increased competition of other means of transportation has been a factor of very great importance, however, there can be no question. There has been an ex-

tremely large increase in the amount of freight carried by steamships through the Panama canal and by motor trucks on highways. There has also been an increase in the amount of traffic handled on some of our inland waterways.

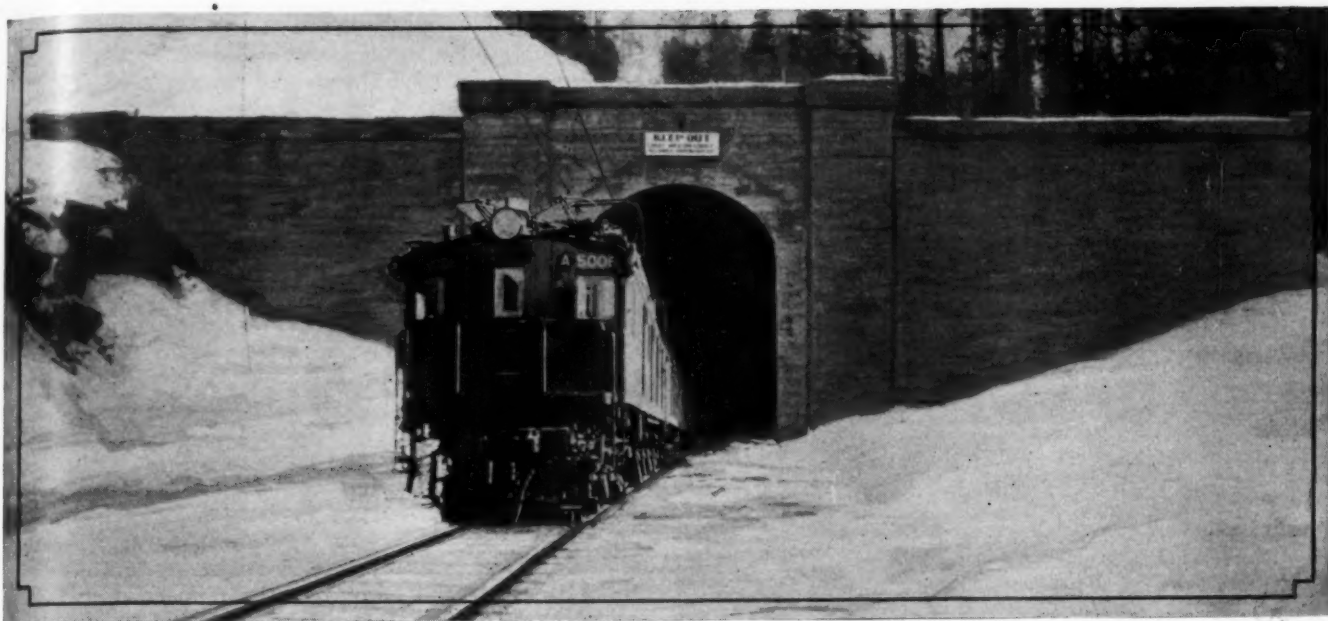
Now, if the diversion of traffic from the railways which has occurred and is still occurring were due to the operation of ordinary economic causes there would be no ground for complaint about it. But this is not the case. The taxpaying public has built and maintains the highways and has provided and maintains the waterways. Their rates are subject to little or no regulation. On the other hand, of course, the railways have furnished their own highways, must pay all the costs of the service they render out of their own earnings, and are subject to regulation which makes it practically impossible for them to so adjust their rates as to protect themselves from other means of transportation.

Attempts are being made to secure the passage of legislation by Congress for the regulation of motor vehicle common carriers furnishing interstate service. From time to time proposals are made to regulate the rates of steamships competing with the railways through the Panama canal. The public and Congress take very little interest in such proposals. Meantime, there is a nationwide agitation for the development of inland waterways and even government ownership and operation of barge lines on them to increase competition with the railways. These projects are advocated to "cheapen transportation." They are, however, to be carried out at the expense of the taxpayers, and their advocates seem to give no consideration to the question of whether the reductions in the cost of transportation it is believed will be secured by the shipper will not be more than offset by the increases in taxes which will have to be paid by the public.

Furthermore, practically no real consideration is given to the probable effects upon the railways, although they are an American industry which is just as much entitled to the fostering care of the government as any other industry. As already indicated, the advocates of all these projects assume that no matter how much traffic is diverted from the railways there will be plenty left for them. Is there no significance in the fact that motor vehicle competition has reduced railway passenger business more than one-third within the last eight years? Is there no significance in the fact that within recent years the growth of railway freight business has been only one-fifth as great as it was before the war? The main thing needed to enable railways to reduce the average cost of carrying each unit of their traffic, and thereby make possible in the long run reductions of rates, is increase in the volume of their traffic. Obviously, if their freight business is to grow in future only one-fifth as rapidly as it did before the war their ability to reduce their costs and their rates will be proportionately diminished. In fact, the influences operating to divert traffic from the railways may become so strong as to render it necessary for them to have advances in rates if they are to continue to render good service.

Facts are more important than mere assumptions. We commend to those who assume that, regardless of the amount of unfair, subsidized competition to which they may be subjected, the railways will always have plenty of traffic, consideration of the facts that, in spite of these assumptions, the railways within eight years actually have lost more than one-third of their passenger business, and that during the ten years ending with 1918 their freight business increased 88 per cent, while during the last ten years it increased only six per cent.

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Great Northern Breaks Records in Tunnel Project

*Improvements in crossing of Cascade range are designed
to effect economies in operation*

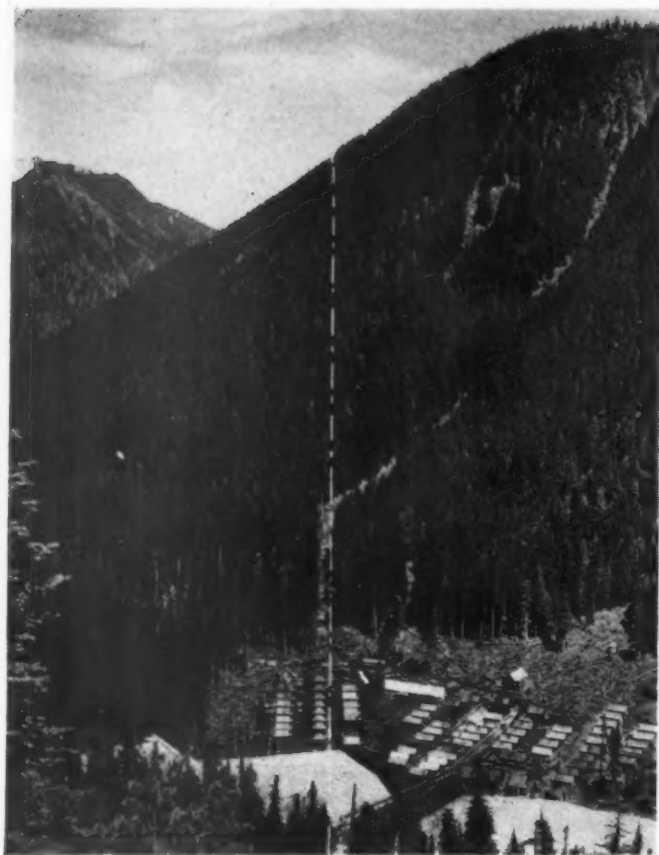
THE \$25,000,000 improvement program in the crossing of the Cascade mountains, which the Great Northern brought to a successful conclusion on January 12 with the unique broadcasting program reported in the *Railway Age* of January 19, comprises one of the largest railway projects carried out in the last decade. While the 7.8-mile tunnel, built at a cost of \$15,000,000, was by far the most spectacular feature of the enterprise, by reason of its record length for railway tunnels on the American continent, and because of the record progress made in its construction, it is only one of three primary units embodied in the improvement as a whole. Of no less importance than the tunnel was the electrification of 72.9 miles of line extending from Wenatchee, some 51 miles east of the east portal, to Skykomish, about 14 miles west of the west portal. In addition, there was included also the construction of 20 miles of new lines between Peshastin, Wash., and Winton for the purpose of reducing grades and curvature on the east approach to the tunnel.

By reason of these betterments, the Great Northern now enjoys the advantages of a greatly improved mountain crossing that has a summit elevation of 2,881 ft., 502 ft. lower than that on the old line, that is 8.88 miles shorter, and that has 3,674 deg. (10 complete circles) less curvature. In addition, the total length of maximum (2.2 per cent) grade is reduced from 24.63 miles to 6.37 miles. Furthermore, the new line avoids entirely the avalanche zone through which the Great Northern had been compelled to construct and maintain 39,870 track feet of snow sheds, no sheds being necessary on the new line.

Because of these improved characteristics of the new line for a distance of 34 miles, together with the electrification, it is anticipated that the schedules of passenger trains can be reduced one hour and of freight trains three hours, in addition to the other economies to be enjoyed by reason of the reduction in rise and fall, curvature and distance, and those economies which are inherent to electric operation.

Break Records in Tunneling

The completion of the new tunnel, the longest railway tunnel on the American continent and the fifth longest in the entire world, is noteworthy as marking a new record in the speed of the construction of railway tunnels of comparative magnitude. It has a length of 41,152 ft. or 7.79 miles, and its completion in 37 months from the time that work was started on November 27, 1925, represents an average elapsed time of 4.8 months per mile of length. This average rate of progress compares with a mile in 7.2 months for the 12.4-mile Simplon tunnel, a mile in 8.2 months for the 5.02-mile Connaught tunnel and a mile in 8.7 months for the 6.11-mile Moffat tunnel. This comparison is not entirely fair, to the latter tunnels, however, because the sinking of a shaft in the valley of Mill creek afforded access to the center line of the Cascade tunnel 2.41 miles from the east portal, in addition to the points of approach at the two portals, but this advantage was offset in part by the fact that the grade of the tunnel, 1.57 per cent, is all in one direction—descending westward. This means that all tunneling operations westward from the Mill creek shaft and from the east portal, had to be carried down hill, a physical condition



View of Mill Creek Valley Showing the Projection of the Axis of the New Tunnel

which has always been considered objectionable in tunneling because of the serious problem it imposes in the event that any considerable discharge of water is encountered during the course of the work, as proved to be the case in this tunnel.

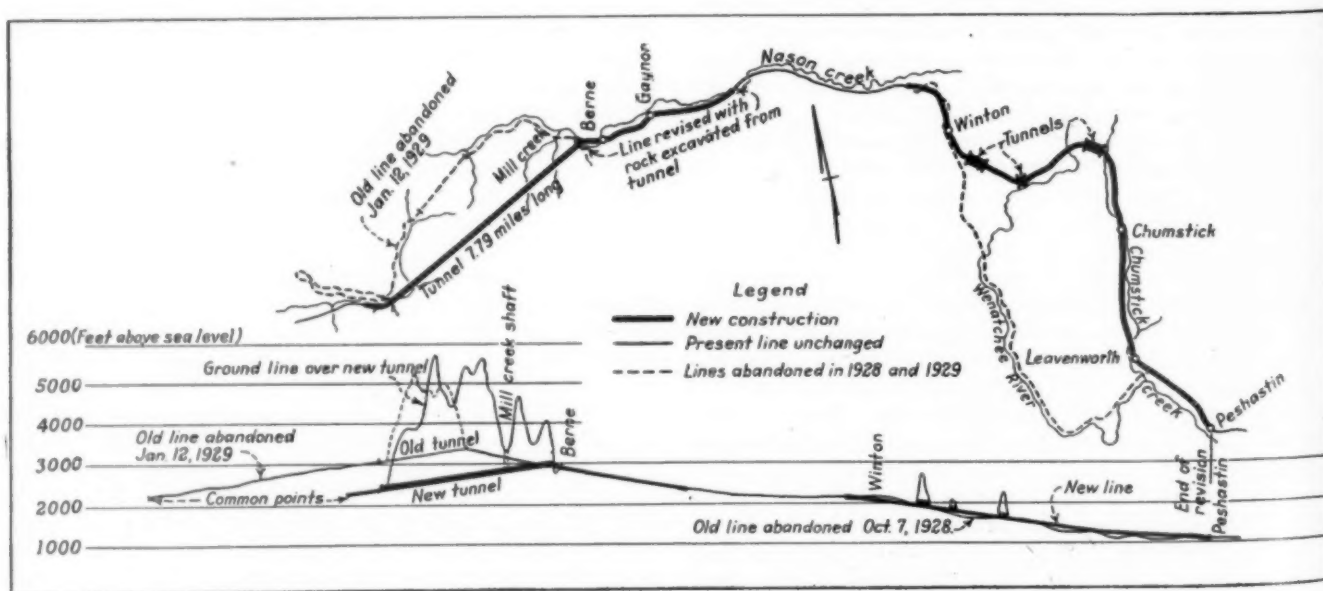
But leaving out of consideration factors affecting the completion of the tunnel as a whole, the driving of the Cascade tunnel affords records of progress in the advancement of headings and in the enlargement to full section, that exceed any previous performance for corresponding working periods on projects of a comparable

character. Thus, during the month of October, 1926, one of the pioneer tunnel headings, having a width of 9 ft. and a height of 8 ft., was advanced 1,157 ft., while the greatest progress in enlargement to the full section of 18 ft. by 25 ft., made during the month of August, 1927, was 1,220 ft. The record of 1,167 ft. for the pioneer tunnel, compares with a record of 932 ft. obtained in the pioneer tunnel of the Connaught tunnel during the month of January, 1915.

Tunneling Methods

The general plan followed in prosecuting the work on this tunnel, as described in an article appearing in the *Railway Age* of December 25, 1926, page 1247, was subject to considerable variation to meet the changing conditions encountered. In general, the length of the construction period was predicated on the time necessary to drive headings from the west portal and from the foot of the Mill creek shaft to a point of meeting, and in accordance with prevailing practice in the construction of railway tunnels of great length, the pioneer tunnel method was employed, the pioneer tunnel, 9 ft. wide by 8 ft. high, being driven parallel to and 66 ft. south of the center line of the main tunnel. However, unlike the application of this method to the Moffat tunnel, where the pioneer tunnel and the center heading in the main tunnel were advanced together as twin headings, pioneer work on the Cascade tunnel was confined to the two pioneer headings, work in the main tunnel being attacked at as many as 11 points simultaneously, through cross cuts provided at intervals of approximately 1,500 ft. Where the character of the rock permitted, this took the form of a center heading, 10 ft. by 10 ft. in section, which was later enlarged to the full section by drilling and exploding ring holes, but where conditions were unfavorable to this method, the top-heading and bench method was employed, and in a few cases resort was had to the bottom-heading method.

The $2\frac{1}{4}$ -mile section between the shaft and the east portal was taken out by the center-heading method, carrying on operations both from the shaft and the portal, but all enlargement operations were carried on progressively from the portal. In this portion of the tunnel, also, it was necessary to deviate from the center-heading method in some instances. A short section





Water Was the Greatest Cause of Delay in the Work

of the tunnel was also enlarged westward from the shaft, before the enlargement from the east portal covered the distance of $2\frac{1}{4}$ miles to the shaft.

The rock encountered was mainly altered granite, an excellent material for drilling, working and mucking, in which operations could be carried over considerable distances without difficulty, but there were many places where soft seams made timbering necessary and slowed up the progress. However, enormous pressures, such as were encountered in the Moffat tunnel and caused protracted delays on that project, were not experienced.

Serious Water Troubles

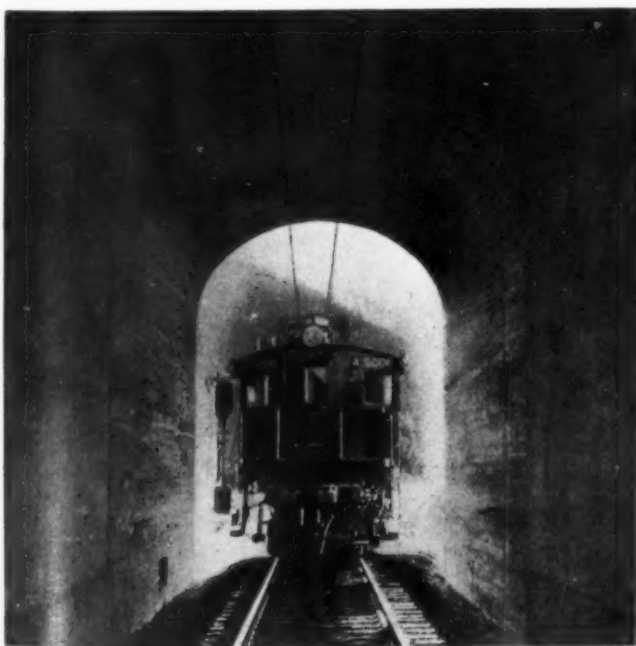
The greatest obstacle to progress was water, the total discharge which had to be disposed of from the west portal, amounting at one time, to 9,000 gal. per min. The pioneer tunnel proved of particular advantage in disposing of this enormous volume of water during construction and will serve as a permanent drainage duct for the normal flow of water which continues to dis-

charge into the finished tunnel. Water, however, proved of much more severe disadvantage in the operations westward from the Mill creek shaft, although the quantity encountered was less than that which came into the heading driven from the west portal. The reason for this is that all of the water which flowed into the heading westward from the shaft had to be pumped up the grade to the foot of the shaft and then up the shaft a vertical distance of 627 ft. to the surface. Just before the tunnel was holed through, thereby permitting the water to be discharged out of the west portal, it was necessary to pump water out of the shaft at the rate of 2,200 gal. per min.

Progress Schedules Maintained

One of the noteworthy features of the project as a whole was the success attained by the contractors in adhering to the progress and completion schedules set up at the time that the work was planned. Thus, the headings between the east portal and the shaft were holed through on March 24, 1927, or 37 days ahead of schedule; the pioneer headings between the shaft and the west portal, came together on May 1, 1928, or 14 days in advance of the estimated date, while the enlargement to full section between the east portal and Mill creek shaft was completed on May 31, 1928, or five months ahead of schedule. It was only in the case of the enlargement west of the shaft that the scheduled date was not met. However, the completion of this work on December 8, was only 38 days behind the scheduled date, and progress on the concrete lining work, described in detail in the *Railway Age* of April 14, 1928, page 850, was so carefully co-ordinated with the tunneling operations, that the concrete lining was completed on December 24, or only 16 days after the tunnel excavation was completed. Track laying in the tunnel was begun on December 25, and completed on December 30, while ballasting was begun on December 29 and completed on January 6. The maximum force employed on the project was 1793 men.

The tunnel project was carried out under the general direction of J. R. W. Davis, chief engineer of the Great Northern, with Colonel Frederick Mears, assistant chief engineer, in direct charge, assisted by N. J. C. Andrews, resident engineer. A. Guthrie & Co., St. Paul, Minn., had the contract for the tunnel project, the



The Tunnel Was Lined With Concrete Throughout

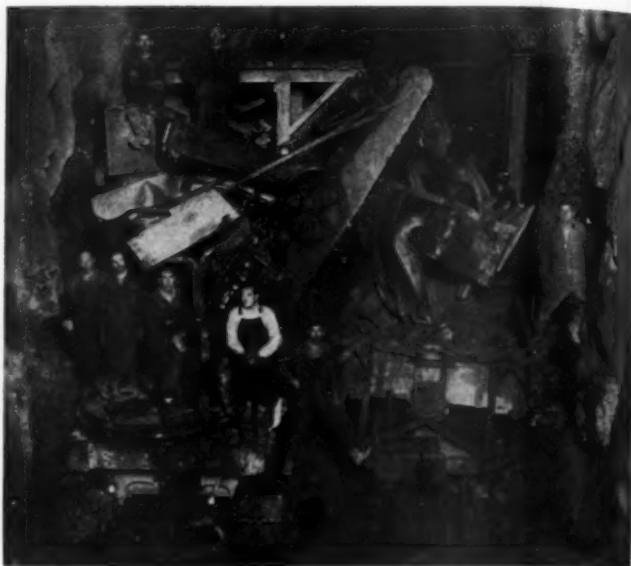
work for the contractor being under the direction of J. C. Baxter, vice president, with R. F. Hoffmark, general superintendent, who was later succeeded by W. E. Conroy.

Build 20-Mile Line

As stated at the outset, the 20-mile line revision on the east approach, or so-called Chumstick line, formed an important feature of the general project. It represents an investment of \$5,000,000 and is in itself the largest grade revision project carried out on the Great Northern in the last 16 years.

From Wenatchee, on the Columbia river, the approach to the summit of the Cascade range follows the general course of the Wenatchee river on a 1 per cent grade as far as Leavenworth. Here the old line entered the winding canyon of the Wenatchee river on a grade of 2.2 per cent, turning, farther up, into the Tumwater canyon which was followed to Winton. From that point the line was again laid on a lighter grade for a distance of about ten miles, to within six miles of the east portal of the tunnel. Thus, by building a new line with lighter grades and less curvature between Peshastin, a short distance east of Leavenworth, and a point about two miles west of Winton, it was possible to eliminate all of the 2.2 per cent grade, except 6.37 miles just east of the tunnel.

From Peshastin, the line follows up the Wenatchee river with the abandoned line, but at a somewhat higher elevation and on a much better alinement, for a distance of about four miles. The river then swings sharply to the west, the old line following it while the new line continues northward up the Chumstick valley, with seven miles of practically tangent track. It then swings westward, leaving the Chumstick valley through a tunnel 2,601 ft. in length, from which it emerges into the Wenatchee valley again and almost immediately crosses the Wenatchee river on a steel bridge 360 ft. long. For the next two miles the line performs the unusual feat of continuing its ascent while following down the river valley. Another tunnel 800 ft. long carries the line into Dead Horse canyon, which is followed for another mile, after which a third tunnel, 3,960 ft. long, brings the new line back into the location of the old one, although the line and grade revision require the separation of the two lines for another three miles.

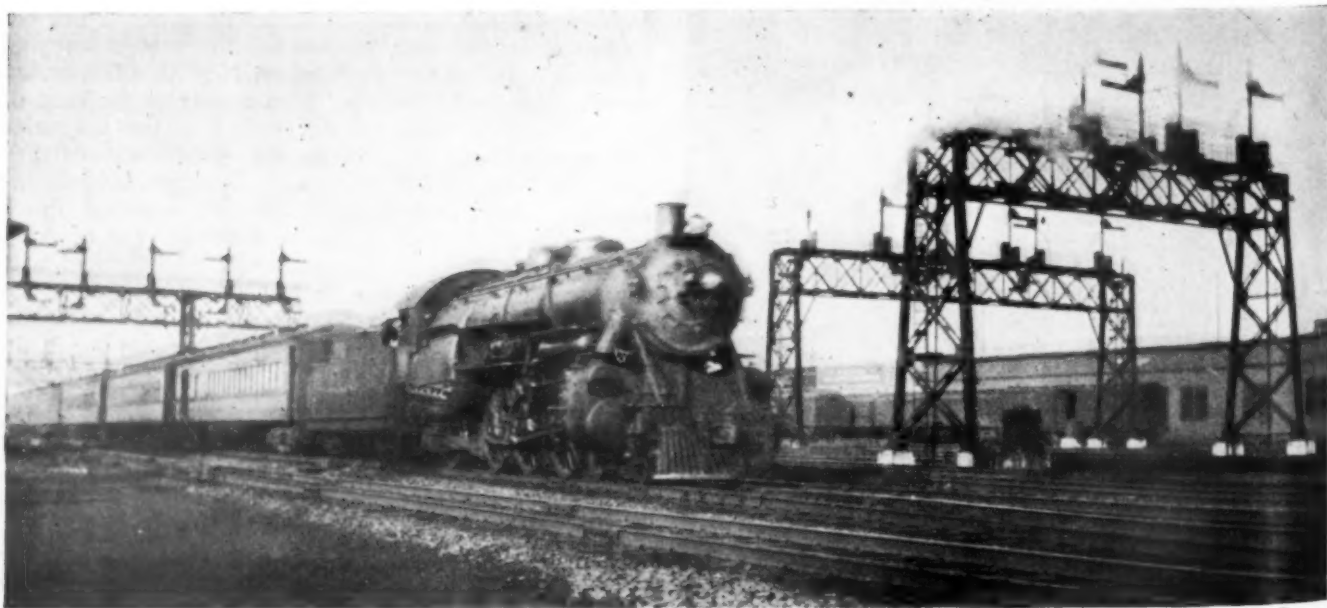


Air-operated Shovels Removed the Muck in the Enlargement Work

The maximum grade on the new line is 1.6 per cent, although the grades for considerable distances are less than that. However, one of the outstanding advantages of the new location, is the fact that it has 48 fewer curves than the old line and reduces the total curvature by more than four complete circles. The sharpest curve on the new line is only three degrees, whereas the old line had several curves of nine degrees. In addition to these advantages, the new line is more than a mile shorter and eliminates the necessity for 1½ miles of snow sheds, which had to be maintained on the old location.

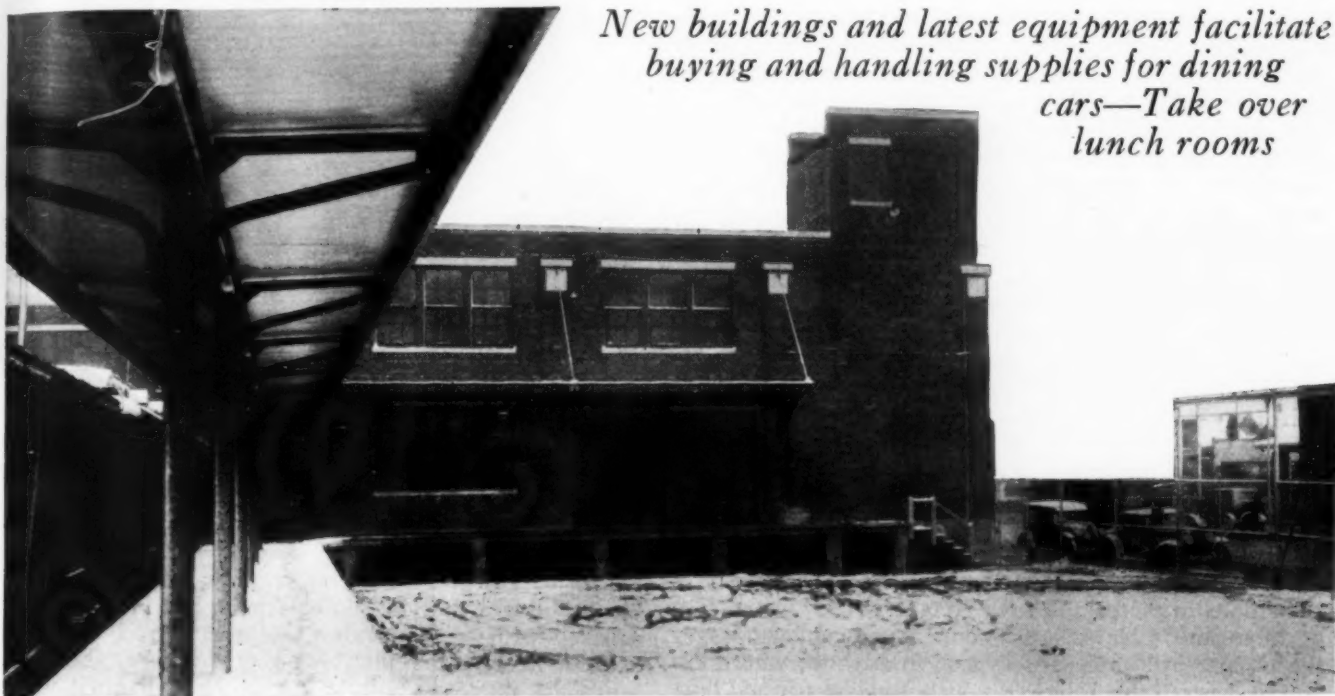
The total grading on the line amounted to 1,610,000 cu. yd. of both rock and earth. In addition to the grading, tunneling and bridge work, the construction involved the relocation of portions of the Steven Pass highway for a total length of approximately two miles. There are no grade crossings on this line. The work on this project was also carried out under the direction of Mr. Davis and Col. Mears, and E. S. Jackson was resident engineer.

* * * * *



A Reading Train at Jersey City, N. J.

Rock Island Improves Commissary Organization and Facilities



New buildings and latest equipment facilitate buying and handling supplies for dining cars—Take over lunch rooms

Rear of New Commissary Building, Showing Canopy Construction

ON December 14, 1928, the Chicago, Rock Island & Pacific opened a new commissary building at Chicago, which is probably the largest and most modern facility of its kind in the middle west. This building follows closely upon the opening of a similar, though smaller, commissary at Kansas City, and the modernizing of this company's laundry at Rock Island. While designed primarily for the economical purchasing and handling of supplies for dining cars and for the improvement in dining car operations, it will

also serve in supplying and operating 7 hotels, 24 lunch rooms, 10 news stands and the train news service, whose operations the dining car department is now taking over. The needs of the Pullman Company and the electrical department are also provided for in the construction.

A Million Meals a Year

The Rock Island operates 42 dining cars in its passenger service between Chicago and Los Angeles, Cal., Denver, Colo., St. Paul, Minn.; Memphis, Tenn., Fort Worth, Tex. and other points. These cars serve approximately a million meals a year. The equipment for these cars ranges from the linen, dishes and silverware which go on each table, to the pots, pans and other utensils in the rolling kitchens, and includes bedding for the crews, and such supplies as soap, cleaning powders, toweling and similar commodities required for maintaining the equipment while in use. The varieties of such items average 200 and the pieces around 1,000, all of which must be bought and replaced as they wear out or become lost or obsolete.

Then there are several hundred varieties of food stuffs and other supplies to be provided, ranging from meat, fruits and vegetables, to beverages, candies and tobaccos. The issues include 23,000 lb. of beef and 11,500 lb. of fresh pork, smoked hams and bacon a month; 1,600 lb. of lamb; and 3,000 lb. of veal, besides other cuts of meat. The Chicago commissary supplies 20,000 lb. of poultry per month and 10,000 lb. of fish, ranging from lake fish to mountain trout from Colorado, salmon from the Pacific coast and halibut, smoked fish and shell fish from the Atlantic seaboard.



In the Main Supply Room, Showing the Steel Shelving

Approximately 45,000 cups of tea are served a month. The coffee issued from Chicago runs in the neighborhood of 2 tons per month; 5,000 lb. of sugar are required monthly; a single creamery supplied 5,313 bottles of milk in October, besides 1,300 gal. of milk and cream, and 800 bushels of potatoes are issued a month while one-third of a car of flour is required monthly in addition to 18,000 loaves of bread, and the pastry which are bought already baked. The bill for provisions reached \$398,663 in 1927, while about \$15,000 was spent for tobacco, \$7,000 for equipment, \$14,000 for new linen and \$28,000 a year for washing linen, which runs into the neighborhood of 432,000 pieces a month.

Favor Bulk Buying

All provisions are bought directly by the dining car department from approximately 100 firms in different parts of the country, while linen, tableware, stationery and similar items are bought through the purchasing department. A primary consideration in buying perishables is one of confining dealings to firms that can be depended upon to provide unfailing service and comply uniformly with the specifications of quality which have been prepared to govern all meat, milk, etc. However, the quality of dining service is also dependent upon the care in the handling and storage of these commodities. In connection with other food stuffs like potatoes, sugar, coffee, etc., also there is a strong inducement to purchase in large quantities at the proper seasons to obtain reductions in prices and save freight. Also, in the case of linen and tableware, economical buying encourages the placing of sizable orders well in advance where exclusive designs are followed which must be formed during manufacture. The Rock Island's system inventory of supplies on hand last October represents the amount of stock carried to meet these conditions and protect the dining service from all contingencies:

Provisions	\$25,127
Kitchen Utensils	2,086
Crockery	23,513
Silverware	13,184
Linen	18,178
Bedding	639
Copperware	299
Glassware	1,425
Total	\$84,451

This inventory, which will be increased as the hotel business is taken over, is carried at Kansas City, and Chicago, but it is principally held at Chicago, from which the entire dining car service work is directed.

A Fireproof Building

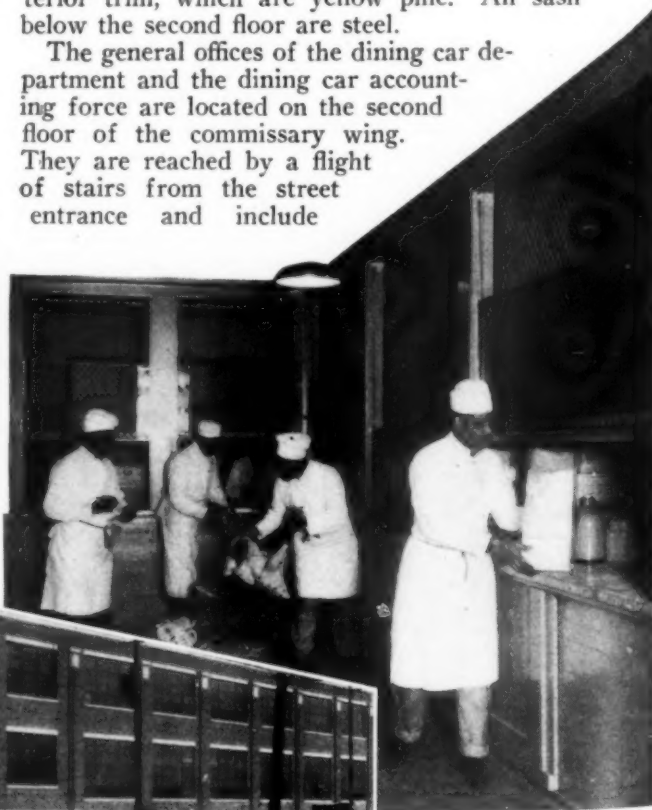
The building, which is located at the coach-yard at 51st Street and Wentworth Avenue, Chicago, is a two story, L-shape structure. One wing, 60 ft. wide and 120 ft. long with a basement, forms the commissary quarters, and the other wing, 60 ft. wide and 120 ft. long, separated from the other wing by a solid brick



In the Concrete Basement Where Bulky Supplies are Stored

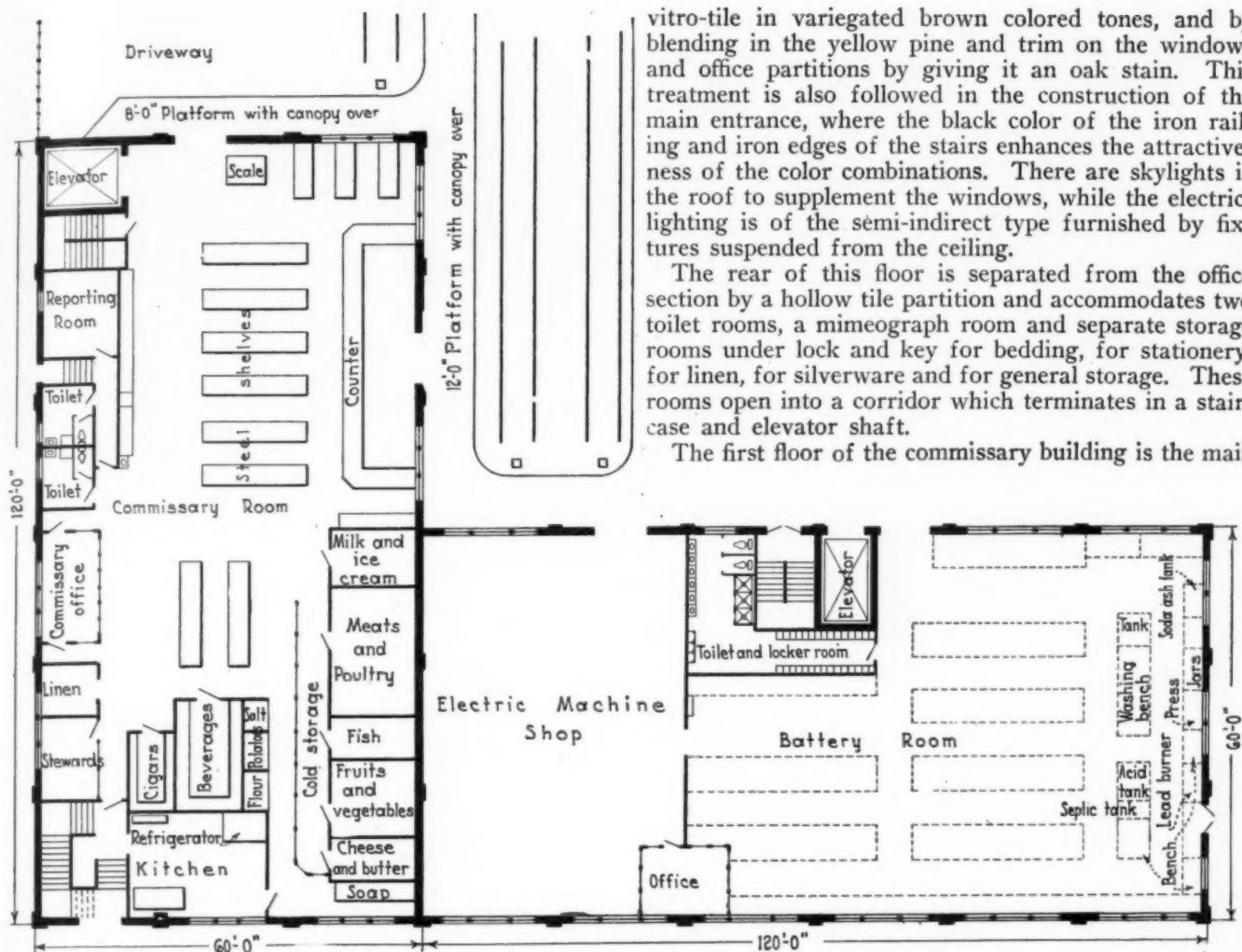
wall, comprises the quarters for the electrical department and also the Pullman service. The structure consists of a steel frame fireproofed with concrete. The floors are of reinforced concrete and so is the roof, which is insulated with Celotex and Insulite and covered with a built-up roofing. The floors are designed for a live load of 150 lb. per sq. ft. The exterior walls of the building are brick, surfaced with red face brick and finished with terra cotta on the outside and, consistent with a fireproofing plan for the structure, the inside walls are made of hollow tile which is painted where appearance makes this desirable. The only combustible materials in the building are the window sash and interior trim, which are yellow pine. All sash below the second floor are steel.

The general offices of the dining car department and the dining car accounting force are located on the second floor of the commissary wing. They are reached by a flight of stairs from the street entrance and include



Top—Stocking the Dining Cars
Bottom—Front of Building





First Floor Plan of Commissary with Electrical Shop Adjoining

a large private office for the superintendent of dining cars and a buyers' room. The office is not only roomy but has been made conspicuously attractive without diminishing its fire resistance by using a red Kalman floor finish, by facing the walls and the office partitions with

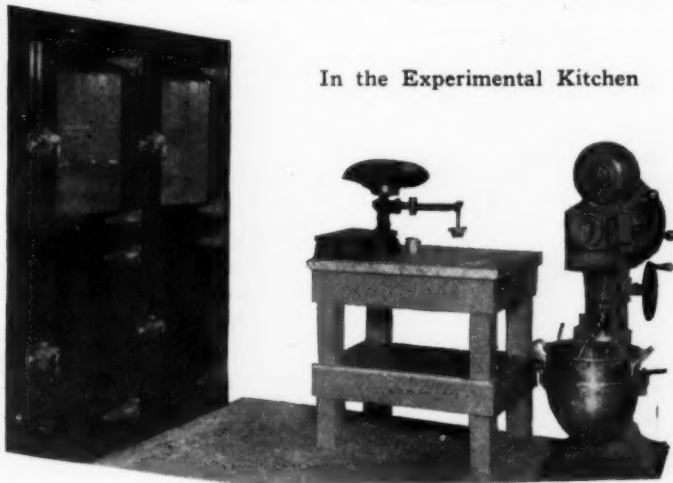
supply and service room, from which the dining cars are stocked with food and where employees report. The floor is built car-door high and is entered from the street and from platforms at the rear and track side of the building. The street side of this floor is partitioned off into a reporting room for dining car employees, a commissary office and a steward's room, while the central space is occupied by rows of steel shelving for the storage of canned goods, cereals, baking powders, and similar supplies, with the exception of tobaccos and bottled goods, which are kept in locker rooms. Mechanical refrigeration is provided for perishable food stuffs,

Entrance to Cold Storage



Springless Floor Scale

In the Experimental Kitchen



while crockery and other supplies bought in large quantities, such as potatoes, flour, sugar and rock salt are stored in a concrete basement 60 ft. wide and 120 ft. long, which is built below the first floor.

Mechanical Refrigeration

The cold storage is one of the features of the new facility. The installation is of the York type, using ammonia, and has a refrigeration capacity equal to that of 25 tons of ice. It is 55 ft. long and 18½ ft. wide, not including the refrigerating machinery, which is installed in the basement, and provides five compartments, one for storing ice-cream and milk, another 12 ft. wide and 18 ft. long for meat and poultry, a third six ft. wide and 12 ft. long for fish, a fourth 12 ft. square, for fruit and vegetables, and a fifth for eggs and butter. These compartments are built with walls, ceilings and floors of alternate layers of cork board, and asbestos, with the exposed surfaces of cement mortar and they are fully equipped with suitable shelving and boxes and with electric lights. The temperature, which ranges from 40 deg. above zero to 22 deg. below zero, is regulated automatically for each compartment, and as additional protection, the doors from each compartment do not open directly into the main commissary room but into a corridor 5 ft. wide which is built along the front of the compartments as an integral part of the refrigerators.

In addition to the refrigeration provided on the first floor, the system is built to serve a large compartment immediately below it in the basement and the piping is also extended to a refrigerator built into the wall of an experimental kitchen on the first floor. This kitchen, which is also a feature of the new building, is equipped with a gas range, boilers and electrically-operated cake mixers and meat grinders for the preparation of foods which can be cooked more economically at headquarters than in cars and for experimental work in cooking.

Provisions are received at the rear platforms from either delivery wagons or cars and brought directly into the building through a sliding steel door without requiring lifting. There is a Fairbanks-Morse springless dial floor scale near this door for all weighing and an Otis automatic push button-controlled elevator of two tons' capacity is installed a few feet away to raise the material to the second floor or lower it to the basement.

Deliveries are made over a counter built on the first floor. The space above the counter is divided by frame work into several windows, each of which is protected by wire netting which is raised when supplies are being issued to crews. When bulky supplies are handled, they are passed underneath the counter through special sliding doors built in for that purpose.

The platforms at the rear and side of the building are concrete and connect with platforms along the car tracks, one of which is lower than car-door height to facilitate coaling the cars and handling storage batteries, etc. The platforms are protected by canopy roofs of corrugated transite and are wired for electric light. Concrete roadways are also built around the plant to serve the car-lighting department, which occupies the first floor of the other wing of the building and for the Pullman Company, which will maintain its linen and supply rooms on the second floor of that wing.

The basement is protected from dampness or excessive humidity by mixing Colloxy waterproofing in the concrete floor and by installing an automatic electric pump below the floor level to handle water which accumulates below the foundation. It is heated by a fan system in which blower fans force air through steam coils equipped with an automatic temperature device to keep the temperature in the neighborhood of 40 deg. The remainder of the building is heated by steam from the shop power-house, which is distributed to radiators by a low pressure vacuum heating system of the C. A. Dunham differential type which is installed in the basement. This system supplies and utilizes steam at varying temperatures in proportion to weather conditions. In mild weather, the steam is subjected to a high vacuum which reduces its temperature while hotter steam is supplied as the weather becomes colder by lowering the vacuum. In balancing the heat supplied with the heat loss by the building, a more constant milder temperature is obtained, thus eliminating over-heating and maintaining a healthful working condition, and with the added effect of economizing on steam consumption.

The new facilities were built by Dwight P. Robinson, Inc., under the direction of A. T. Hawk, engineer of buildings of the Rock Island who also prepared the plans. The commissary, with all other dining car work, is operated under the direction of T. D. Wickham, superintendent of dining cars.

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Railroad Yards at Cleveland, Ohio



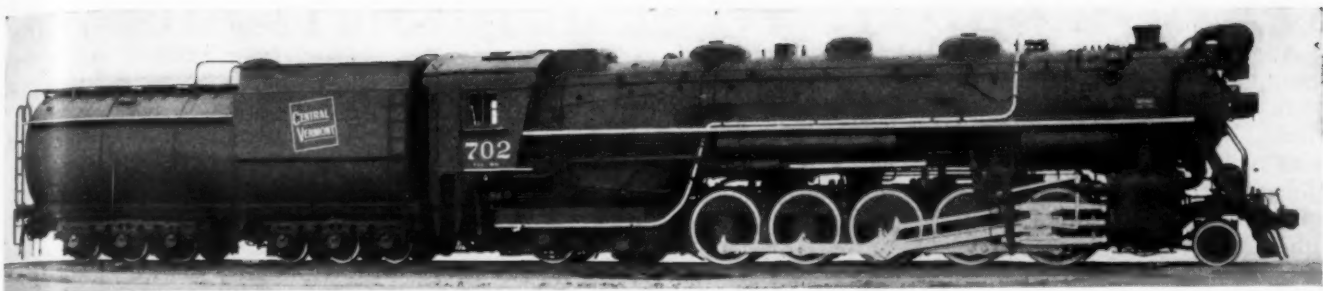
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One of the 2-10-4 Type Locomotives Built for the Central Vermont by the American Locomotive Company

Central Vermont Receives Ten 2-10-4 Type Locomotives

Designed for 250-lb. boiler pressure and develop tractive force of 75,800 lb. without, and 89,000 lb. with a booster

THE Central Vermont has recently placed in service between St. Albans, Vt., and White River, Junction, N. H., ten 2-10-4 type locomotives built by the American Locomotive Company. These locomotives, which have a tractive force at 60 per cent cut-off of 75,800 lb. and with the booster, a tractive force of 89,000 lb., will replace, in the main, consolidated locomotives that have a tractive force of 50,000 lb. The new locomotives will not only replace more than ten locomotives, but will haul 50 per cent more tonnage over an equivalent ruling grade of .92 per cent.

Of the total engine weight of 419,000 lb., 285,000 lb. is carried on the 60-in. driving wheels. Steam to the 27-in. by 32-in. cylinders is controlled by the Baker long-travel valve gear and a Precision reverse gear. The piston valves are 14 in. in diameter.

The Boiler and Machinery

The boiler, which is made of high tensile silicon steel, is of conical construction with an outside diameter at the front ring of 84½ in. The firebox has a grate area of 84.4 sq. ft. This provides one square foot for each 82 sq. ft. of combined heating surface, which totals 6,911 sq. ft. The length over the tube sheets is 22 ft. and the combustion chamber is 4 ft. long. The boiler is equipped with a Type E superheater and an Elesco feedwater heater. The steam passes from the boiler into an American type multiple throttle. The auxiliaries

Principal Dimensions Weights and Proportions of the 2-10-4 Type Locomotives for the Central Vermont

Railroad	Central Vermont
Type of locomotive	2-10-4
Service	Freight
Cylinders, diameter and stroke	27 in. by 32 in.
Valve gear, type	Baker
Valves, piston type, size	14 in.
Maximum travel	9 in.
Outside lap	2¾ in.
Exhaust lap	1/16 in.
Lead in full gear	¾ in.
Cut-off in full gear	60 per cent
Weights in working order:	
On drivers	285,000 lb.
On front truck	35,000 lb.
On trailing truck	99,000 lb.
Total engine	419,000 lb.
Tender	269,600 lb.
Wheel bases:	
Driving	22 ft.
Rigid	22 ft.

Total engine	44 ft. 2 in.
Total engine and tender	82 ft. 2¾ in.
Wheels, diameter outside tires:	
Driving	60 in.
Front truck	33 in.
Trailing truck	33 in., 43 in.
Journals, diameter and length:	
Driving, main	12½ in. by 13 in.
Driving, others	10 in. by 13 in.
Front truck	7 in. by 12 in.
Trailing truck	7 in. by 14 in.
	9 in. by 14 in.
Boiler:	
Type	Straight top
Steam pressure	250 lb.
Fuel, kind	Bituminous
Diameter, first ring, inside	84½ in.
Firebox, length and width	126½ in., 96¼ in.
Arch tubes, number and diameter	3—3 in.
Combustion chamber length	4 ft.
Tubes, number and diameter	33—2¼ in.
Flues, number and diameter	192—3½ in.
Length over tube sheets	22 ft.
Grate type	Rocking table
Grate area	84.4
Heating surfaces:	
Firebox and comb. chamber	321 sq. ft.
Arch tubes	22 sq. ft.
Syphons	80 sq. ft.
Tubes	426 sq. ft.
Flues	3,854 sq. ft.
Total evaporative	4,703 sq. ft.
Superheating	2,208 sq. ft.
Comb. evaporative and superheating	6,911 sq. ft.
Special equipment:	
Superheater	Type E
Feedwater heater	Elesco
Stoker	Standard B. K.
Syphons	Nicholson
Booster	Franklin trailer
Tender:	
Style	Vanderbilt
Water capacity	13,500 gal.
Fuel capacity	20 tons
General data estimated:	
Rated tractive force, engine, 60 per cent.	75,800 lb.
Rated tractive force, engine, with booster.	89,000 lb.
Weight proportions:	
Weight on drivers ÷ total weight engine, per cent.	69.0
Weight on drivers ÷ tractive force.	3.81
Total weight, engine ÷ comb. heat. surface.	60.6
Boiler proportions:	
Tractive force ÷ comb. heat. surface.	10.9
Tractive force × dia. drivers ÷ comb. heat. surface.	659
Firebox heat. surface ÷ grate area.	5.01
Firebox heat. surface, per cent of evap. heat. surface.	8.97
Superheat. surface, per cent of evap. heat. surface.	46.8

are grouped into two turrets, which are located outside of the cab. The turrets are protected by a metal cover on the top of which is built two sliding doors. Each locomotive is equipped with two sand boxes, one supplying the front pair of drivers and the other the rear pair of drivers and the trailer truck.

The firebox, which is equipped with two thermic syphons, is provided with round-hole table grates, fitted

with removable lugs. The stoker is of the Standard B.K. type.

Alloy steels are used extensively in the frame and the machinery. The frames are cast of nickel-carbon steel. The main rods are made of hammered nickel steel. The main rods are of the tandem type, fitted with floating bushings. The crossheads are of the Rogatchoff adjustable design. The valve gear and the spring rigging are fitted with the Alemite system of lubrication.

Commonwealth trailing truck, cradle castings and water-bottom tender frames, are used on these locomotives. The Vanderbilt type tenders are provided with three water-filling holes, located along the horizontal center line of the top of the tank. This reduces the difficulty of spotting a locomotive under a standpipe for taking water. Six-wheel trucks are used under the tender.

Because of the cold climate in which these locomotives must operate during the winter months, they are provided with vestibule cabs. The cabs are made of steel and lined with sheathing in the inside. The cab valves are all mounted on one board with each handle properly labeled. The locomotives are equipped with back-pressure gages. Wherever possible, the steam pipes have been placed under the jacket, but where it was necessary to expose the pipes, they were lagged, self-drained and equipped with frost cocks, which automatically drain the condensate in the pipes when the pressure falls to a predetermined value.

The locomotives are fitted with non-lifting injectors and Nathan four-feed mechanical lubricators. The locomotives are piped for steam heat for emergency use in passenger service.

Calendar Revision Favored From Statistical Standpoint

WASHINGTON, D. C.

DR. M. O. LORENZ, director of statistics of the Interstate Commerce Commission, testified at a hearing before the House committee on foreign affairs on January 18 in support of the proposal in House Joint Resolution 334 that the United States participate in an international conference for the revision of our present calendar.

What is desired from a statistical standpoint, he said, is to have a calendar according to which any period in one year will have the same number of working days, Sundays and holidays, respectively, as occurred in the corresponding period in other years.

"This would eliminate or reduce a source of difficulty in statistical comparisons because at present one must be on his guard to see whether or not a given percentage of increase is affected by variations in the nature and number of the calendar days," he said. "Thus, for October, 1928, the reported railroad freight revenues showed an increase of 8.7 per cent over those of October, 1927, but when we consider that October, 1927, had five Sundays, and October, 1928, only four, the increase per working day was only 4.7 per cent. Again, in our wage statistics, the report for October, 1928, shows a decrease in aggregate hours, without reference to number of working days, of 0.4 per cent as compared with the same month in the preceding year, thus giving the impression of practically no change in employment, while a substantial decrease of 4.1 per cent is shown to have occurred in the hours worked

when an adjustment is made for the number of Sundays in the two periods. An accurate adjustment is not possible in this case because some railway employees have to work on Sundays. What is needed is the same assortment of days in each period.

"The defective character of the present calendar comes to light in the weekly carloading statistics published by the American Railway Association. It issues a report every week, covering seven days ending with Saturday, showing the number of cars loaded; and these reports are watched with much interest by students of business trends. In 1927 there were 53 Saturdays, and hence 53 reports were made. To compare these reports with the 52 reports of the preceding year required an arbitrary adjustment. In making a diagram comparing the weekly carloadings of any year with those of the preceding years, an arbitrary adjustment is necessary to make the National holidays fall in corresponding weeks. If we wish to compare these carloading data with other monthly statistics, it becomes necessary to split the weeks. In practice, these statistics are summarized, not by calendar months, but in four and five week periods. It is interesting to note that the English railways also use groups of four weeks instead of calendar months in some of their statistics.

"It is true that such statistical difficulties resulting from the present calendar have been experienced for many years, and it is also true that the most of our statistical work is not affected by calendar irregularities, and, if necessary, we can continue to get along as we have in the past, just as we could perpetually endure a slight toothache, but it seems worth while to prevent such continual annoyance so far as practicable, even if making the change entails some cost. These considerations are merely supplementary to others. Every citizen that writes letters or checks, makes appointments, or for other reasons has frequently to consult the calendar, would be benefited by a saving of mental labor and confusion. When an improvement that is relatively small in itself will constantly benefit millions of people in their daily lives for centuries to come, it thereby acquires a very great importance that far outweighs the temporary inconvenience of putting it into effect. There are some disadvantages in every arrangement of the calendar that has been suggested, but we should have the best calendar attainable, and for this reason, I think a proposal to have an International Conference, at which all possible points of view could be brought together, is to be heartily supported."

* * *



Barrientos Canyon Near Mexico City, National Railways of Mexico

Traffic Facilitated by Signals on the Missouri Pacific

*Installation on 147-mile division saves an average of 63 minutes on each northbound freight train—
Loading increased 160 tons*



Signals at End of a Center Passing Track on the Double-Track Section in Which "Against-Traffic" Movements Are Made By Means of Clockwork Time Releases

AN impressive reduction in the time of through freight movements between Little Rock, Ark., and Texarkana, 147 miles, has been made by the Missouri Pacific as the result of a recent installation of signaling. This freight district forms a part of the 326-mile territory on the Arkansas division which has been equipped with absolute permissive block signals.

A comparative study of the through freight train movements before and after the signaling was installed shows that an average saving of 24.4 min. southbound and 63.7 min. northbound has been effected in through freight train movements between these points. An average of 22 freight trains are operated daily. This saving represents those delays which have been eliminated by the signals themselves; by the remote-control installations, by the interlocking plants and by facilitating train movements with "against-traffic" operation on double track.

Such savings as have been due wholly or partly to improvements other than the signal installation have not been included in the above. At Gurdon, Ark., for instance, where there has been a saving of 42.6 min. southbound and 50.1 min. northbound, the improvements included not only the signal installa-

tion, but also yard improvements and double track from R. O. Junction to Bierne. Although it cannot be definitely determined what part of this saving can be credited to the signal installation, it can be said that probably the larger proportion is due to the signals, as the trains are not now delayed at Gurdon for orders, but are operated through this section entirely by signal indication, and run in either direction on either track. Also, the signaling is entitled to an indefinite proportion of whatever delay may have been eliminated at the initial terminal by the signaling.

A further large saving effected by the signals has been shown in the increase in train load. Before the signal installation, the average train load between Little Rock and Texarkana was approximately 1,840 tons. Without any increase in power, this train load has been increased to approximately 2,000 tons, or an average of about 160 tons or 8.7 percent on through freight trains.

The first freight district on the Arkansas division extends from Poplar Bluff, Mo., to Little Rock, Ark., a distance of 179 miles, 68.2 miles of which is double track. The second district extends from Little Rock, Ark., to Texarkana, 147 miles, of which 41.4 miles is double



Freight Train Passing Through Remote Control Section Just South of Bryant, Ark.—Remote Power Switches Are Controlled by Operator at Bryant

track. Both districts are provided with general Railway Signal Company, Type-D, three-indication color-light signals. Five interlocking plants are located on each district, three of which on the first-named district are at drawbridges. Gates are provided at five railroad crossings in the territory. The signals as well as the interlocking functions of these plants and also the gates are tied into the signal system.

On account of the installation of remote-control switches, it has been possible to take off 32 operators between Poplar Bluff and Texarkana. In some instances, the telegraph office has been closed, which not only relieved three operators, but also the telegraph maintenance at these points. As the signal maintainers

On the sections of double track from Bald Knob to Little Rock, 57.5 miles, from Little Rock to Benton, 23 miles, and from Clear Lake Junction to Texarkana, 18.4 miles, no permissive signals are installed for "against-traffic" moves, but an absolute signal is provided to direct such movements leaving each station, in addition to the usual automatic block signals for the "with-traffic" direction. In order to cross over for an "against-traffic" movement, a clockwork time release is provided in the telephone booth at the crossover switch, operated by the telegraph operator at an open office or by trainmen at a blind siding. When the release is operated to make an "against-traffic" movement into a clear block, all opposing signals in the block in advance assume the stop position,



Two Freight Districts on the Arkansas Division Have Recently Been Equipped with Absolute Permissive Block Signals

now take care of the switch lamps, and there are no oil signal lamps, all of the lamp tenders on both districts have been taken off. These are the savings which stand out prominently and can be credited directly to the signal installation. However, many other savings result indirectly from the installation. The wear and tear on the equipment is less, due to the elimination of stops. There is also a per diem saving on the cars.

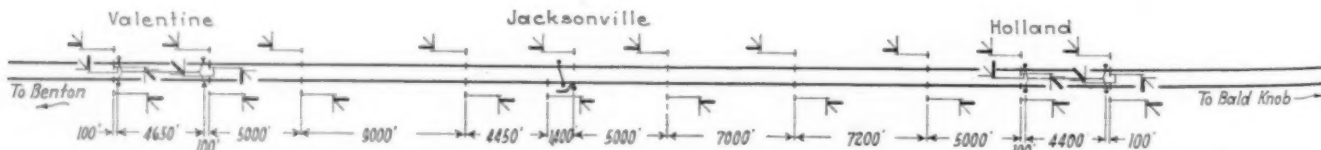
Another element that has not been taken into account and cannot be measured in dollars and cents is safety, which the local operating officers consider an important factor in raising the morale of the men, through the establishment of confidence in the operation of the signal system and of a spirit of co-operation, resulting in more efficient performance. The last monthly report shows 100 per cent signal operation in this installation.

A. P. B. System on Single Track

On single track, the signals are controlled by the conventional absolute permissive block system, while on the

and a clear indication is given to the train desiring to make the move. After this train has crossed over, entered the block and is moving "against-traffic," it automatically clears ahead of itself, the "against-traffic" absolute signal leaving each station, providing the train continues to move against traffic into another block and providing, of course, the block is not occupied. Center-siding locations were selected as reversal-of-traffic points, in such a way that a train moving against traffic in one block and returning to the "with-traffic" track at the end of that block does so at the near switch and, therefore does not set up the signal for "against-traffic" movement in the next block.

"Against-traffic" movements in this territory are made only on the authority of a train order, as the blocks are from station to station, no intermediate "against-traffic" signals being provided. The absolute signals are so located, however, that in the future when traffic justifies, additional installations may be made to permit train operation by signal indication without train orders. Tele-



A Section of the Double-Track Line in Which "Against-Traffic" Movements Are Made with the Aid of Clockwork Time Releases Operated by Telegraph Operators or by Trainmen

double track, automatic signals are provided for following movements on the right-hand running track. In order to utilize idle sections of the left-hand main, to operate trains against the normal direction of traffic, two different systems of control are used. One method, using time releases for setting up the direction of traffic, which can be handled by the train crew, is effective in securing the results desired under ordinary traffic. On shorter sections of double track approaching terminals or junctions, a remote control system handled by an operator is used to control the remote-power switch machines and signals to direct train movements by signal indication.

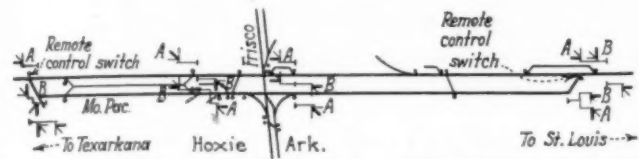
phone booths have been placed at the cross overs and blind siding locations for the use of train crews in communicating with the dispatcher.

Remote-Control System for Switches and Signals

The double-track line between Walnut Ridge and Hoxie Yard, and between R. O. Junction and Bierne, is signaled complete for train operation over either track in either direction. The switches are power-operated under the control of an operator at each of these sections, who handles all train movements into and through the territory. As an illustration, the telegraph operator at Hoxie handles all movements into and through the

double-track section from Walnut Ridge to Hoxie, from either direction, without the use of train orders, the movements being handled entirely by signal indication. Desk circuit controllers and annunciators are provided in the telegraph office. The annunciators give the operator sufficient indication of the approach of a train so that he may operate the desk circuit controllers and "set up" the desired route for the train over either track.

Four desk circuit controllers are used, one for each of the two turnouts and one for the signals on each track. The first part of the stroke of the switch lever controls its respective turnout switch. When the switch has moved to the proper position and indicated, the final stroke of the lever may be made to clear the signal over the turnout. The two signal levers are used to select the signals for the desired direction of traffic. The A. P. B. system of signaling providing for following movements, is used here as on the balance of



Remote Control Facilities on Double-Track Section at Hoxie, Ark.—Telegraph Operator Handles Movements by Signal Indication

the district. Number 20 turnouts were provided at these power-operated switches in order to permit a speed of 30 m.p.h. over the turnouts.

Other Special Signaling of Interest

On account of unfavorable grade conditions and the heavy traffic involved, the inside siding at Bryant on the double-track section between Little Rock and Benton is equipped with No. 20 turnout switches. The operator, who is located at one end of the siding, handles the switches at that end by mechanical interlocking and those at the distant end by remote control. At Benton, where the line to Hot Springs branches off, an interlocking plant is provided to handle all the switches and signals. The double-track switch near the station, some distance from the interlocking plant, is remotely controlled by the operator in the tower.

The switches at the end of double track at Harviell and at Clear Lake Junction are handled mechanically by the operator, while those at Diaz and Tower "A" are remotely controlled by the operator located centrally at Newport. The one at Bald Knob is similarly handled by the operator in the station some distance away.

On adverse maximum grades throughout the territory, tonnage markers have been provided. These permit a train having 75 per cent of its engine rating to pass under control a permissive automatic signal displaying a stop indication.

Except at locations where special circuits are involved, the line circuits are standard for this system of signaling, three wires being used between stations and five wires through station limits to provide two caution signals for opposing moves approaching sidings. The line wires are carried on an independent signal pole line, the top crossarm of which is used for a 4,400-volt power line, which supplies current for operation of the signal system. Power is purchased from utility companies at 220 volts a-c. It is stepped up through transformers to 4,400 volts and carried to various signal locations, where it is stepped down to the required voltage. The substations for power supply are located

from 25 to 60 miles apart, depending on availability of reliable sources of commercial power. Each source of power may act as an emergency relief for the substation on either side. Storage batteries, charged by the a-c. floating system, provide an 18-hr. standby capacity in case of power failure.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading during the week ended January 12 amounted to 914,187 cars, an increase of 115,464 cars over the total in the preceding week which included the holiday January 1. Loading exceeded by 6,886 cars the total in the corresponding week of last year but was 28,544 cars lower than in the corresponding week of 1927. Coal contributed to the increase in the total over a year ago and to the decrease from the 1927 total. Loading in the Southern and Northwestern districts was smaller than in the corresponding week of last year. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Districts	Week Ended Saturday, January 12, 1929		
	1929	1928	1927
Eastern	210,075	201,241	214,884
Allegheny	185,961	180,581	189,972
Pocahontas	57,935	53,940	58,411
Southern	139,899	144,826	148,861
Northwestern	103,990	113,972	109,098
Central Western	140,974	138,968	142,916
Southwestern	75,353	73,773	78,589
Total Western Districts	320,317	326,713	330,603
Total All Roads	914,187	907,301	942,731
Commodities			
Grain and Grain Products	44,083	48,751	43,983
Live Stock	32,008	32,389	33,008
Coal	213,541	191,228	228,440
Coke	11,691	11,069	11,932
Forest Products	54,280	59,704	65,020
Ore	9,732	9,330	8,554
Merchandise L. C. L.	234,666	240,087	237,818
Miscellaneous	314,186	314,743	313,976
January 12	914,187	907,301	942,731
January 5	798,723	754,247	933,890
December 29		667,586	680,554
December 22		897,968	829,810
December 15		964,086	868,750
Cumulative totals, 2 weeks	1,712,910	1,661,548	1,876,621

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended January 12 totalled 57,051 cars, an increase over the previous week of 10,859 cars, and a decrease of 9,477 cars from the same week last year.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
January 12, 1929	57,051	36,266
January 5, 1929	46,192	31,007
December 29, 1928	44,242	31,562
January 14, 1928	66,528	37,299
Cumulative Totals for Canada		
January 12, 1929	103,243	67,273
January 14, 1928	118,288	66,421
January 15, 1927	116,528	63,775

WHEN WE SAY THAT MOTOR TRANSPORT IS CHEAPER THAN RAIL we do not include in the former bill the amount spent out of taxation on making and repairing the roads, or the compensation paid out of local taxes for widening streets, and so on. From the immediate business angle, of course, which takes short views, there is no particular reason why we should; the cashier is concerned with the bill, and no more than the bill. But in any scientific analysis of costs these factors could no more be left out than the cost of the hangars out of an air company's balance-sheet. And if they were included it might not be found that the motor had cheapened transport much. Moreover, a surplus of available transport means waste—idle machines, labor paid without full yield, empty coaches; the industry appears to be running to maximum, but it is really tending more towards minimum efficiency. Somebody has to pay the eventual losses.—Evening Standard (London).

Steel and Composition Flooring for Passenger Cars

A CAR flooring, which consists of a double truss plate form of steel sub-flooring covered with Masticoke, an asphalt composition wearing surface, has been placed on the market by the Johns-Manville Corporation, 292 Madison avenue, New York.

The truss plate is made of two sheets of No. 22 U. S. S. gage copper-bearing steel, in which staggered rows of oval cones have been pressed. The two sheets are then placed so that they can be riveted or welded together through the tops of the cones. The finished truss plates are coated inside and out with a mineral rubber rust proofing paint for steel, which protects the under side and provides a bond for the surfacing material.

While the double truss plate itself weighs more than other types of steel car sub-flooring, the finished floor weighs much less. The mechanical strength of the plate makes a $\frac{3}{8}$ -in. or $\frac{1}{2}$ -in. wearing surface practicable, whereas other floor structures rely on a thicker wearing surface for strength. A large percentage of the surface of the truss plate is flat. There are no large keyways that must be filled with surfacing material, thereby adding weight.

The truss plate weighs 2.5 lb. per sq. ft. Masticoke weighs 1 lb. per sq. ft. for each $\frac{1}{8}$ in. of thickness, giving a total of 5.5 lb. per sq. ft. for a $\frac{3}{8}$ -in. wearing surface. The plate is made 30 in. wide and in any convenient length up to a maximum of 144 in. The overall thickness of the double truss plate is $\frac{7}{8}$ in.

The cones or depressions measure $3\frac{1}{2}$ in. by $1\frac{3}{8}$ in. at the base and are arranged in alternate rows of six and seven each, which allows the depressions to overlap slightly. The rows are spaced on $2\frac{1}{2}$ in. centers, both longitudinally and transversely. The distance from the center of the outside row to the edge of the plate is 2 in., leaving a flat margin of $1\frac{5}{8}$ in. for splic-

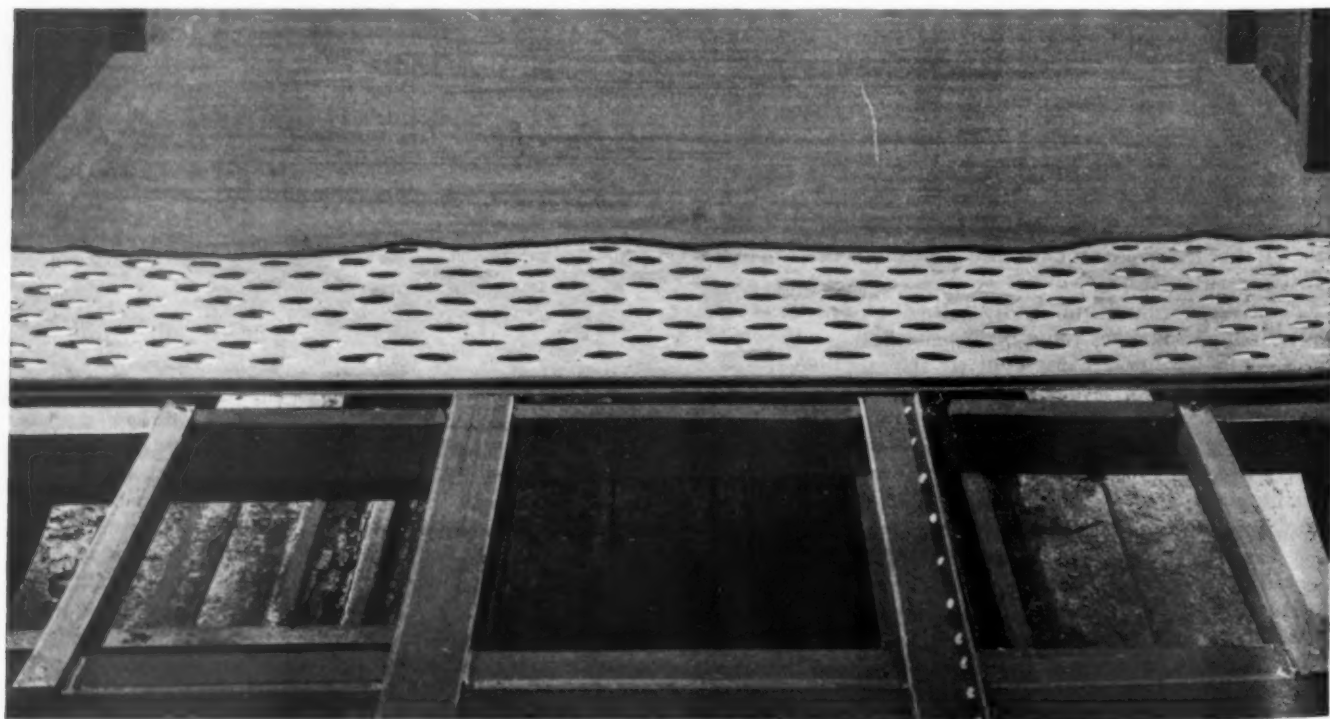
ing adjoining plates. At the ends, the distance is $3\frac{1}{4}$ in., leaving a flat margin of $1\frac{1}{2}$ in.

Provides Uniform Flooring

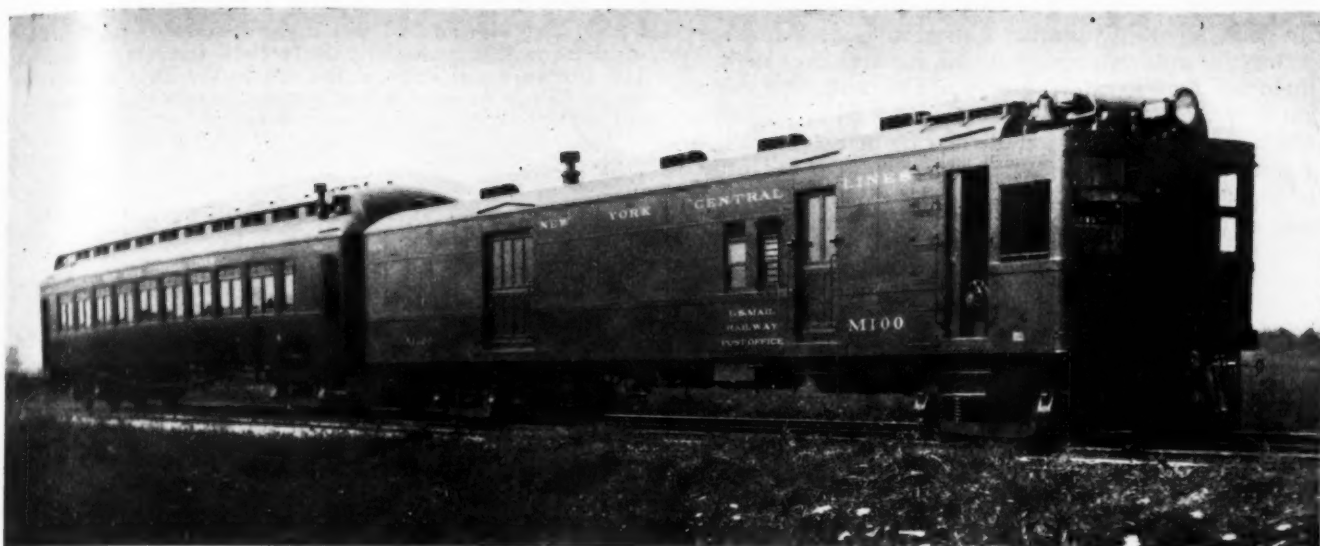
Masticoke provides a flooring that is uniform in texture, pleasing in appearance and thoroughly waterproof. Its asphaltic composition makes it sufficiently plastic to accommodate itself to the weaving of the car frame and minimizes the formation of transverse cracks in the floor. Masticoke is furnished in black, which may be used as the finished floor or as a base coat for the application of a colored mastic wearing surfaces. Mastic is furnished by the manufacturer in the following colors; maroon, tan, brown, mahogany, olive green or verde green.

Masticoke and mastic floors are easy to repair. A perfect repair can be made by remelting the original material or substituting new material and sealing the joint with a blow torch. A colored surface is used over a black base to show when a safe limit of wear has been reached. When the black is exposed, a repair can be made by trowelling on enough of the colored material to bring the floor back to its original level. A perfect bond and matched in color is secured between the old and the new material.

THE DEPARTMENT OF PUBLIC UTILITIES of Massachusetts, in its annual report, recommends that the state adopt a more vigorous policy in the matter of abolition of highway grade crossings. The commissioners believe that the state should pay a larger share of the cost of these improvements than is now generally paid, evidently believing the policy of New York state to be the better one. The report says that the railroads ought to be relieved of the maintenance of passenger stations short distances apart, where local passenger travel has become very light, and suggests that the railroads ought to do substantially an express-train business, leaving local traffic to be attended to by street railways or motor coaches. The fast traffic and the slow traffic here recommended ought to be co-ordinated, says the report.



Car Underframe Showing the Truss Plate and Asphaltic Wearing Surface Applied



Electro-Motive Gas-Electric Motor Car and Trailer on the Cincinnati Northern

Motor Cars Handle Cincinnati Northern Passenger Traffic

Four electro-motive units have demonstrated reliability and economy of operation over a period of 38 months

SINCE September, 1925, all of the passenger trains on the Cincinnati Northern have been operated by gas-electric rail motor cars with the exception of a very small portion of passenger train mileage occasioned by accident, heavy traffic or failure. This proportion, handled by steam locomotives, has actually amounted to less than five per cent of the total scheduled mileage. The Cincinnati Northern was one of the first roads to adopt the modern type of gas-electric unit and is one of the very few roads that handles all of its passenger traffic with this type of equipment.

The road runs in a north and south direction between Cincinnati, Ohio and Jackson, Mich. a distance of 244.1 mi. The passenger service is operated daily, except Sunday. One train leaves each terminal of the road in the morning making the run over the entire length of the road. Two other runs are turn-around runs, one from Van Wert, Ohio, to Jackson and return, a total mileage of 205.4, and the other from Van Wert to Cincinnati and return, a total of 282.8 miles.

Equipment and Operation

The motor cars are combination baggage and mail, having a weight of 83,000 lb., and also are equipped with Electro-Motive Company, 225-hp. gasoline-electric power plants. These cars haul a standard wood day coach as a trailer. The weight of the trailer is 84,000 lb. and the seating capacity 82 persons.

Under steam-locomotive operation eight locomotives were assigned to passenger service. Under present conditions the traffic is handled by four motor trains with one steam locomotive held for emergency service as relief equipment.

An analysis of the operating figures for the first six months of 1928 will furnish a typical illustration of the motor train performance.

Total passenger train mileage	152,356
Total motor train mileage	149,914
Total steam train mileage because of:	
Motor car failures	999
Freight derailments	488
Heavy travel	282
Accidents to motor cars	673
	2,442

On the basis of the above figures the motor trains accounted for 98.4 per cent of the passenger train mileage during the period. Deducting only the steam train mileage occasioned by the failure of motor cars the percentage is 99.3. The majority of accidents which disable a motor car are grade crossing collisions with motor trucks or automobiles. In case the motor car is unable to proceed it is hauled to its destination and repairs are made in the layover period.

Cost of Operation

Over a period of 34 months, to and including July, 1928, the four motor cars had covered approximately 765,000 miles. The fuel consumption during this period totaled approximately 544,000 gal. of gasoline, resulting

Average Cost of Motor-Train Operation Per Train Mile

	Cents per train-mile
Repairs	10.21
Crew wages	13.00
Fuel	9.65
Lubricants	0.85
Other supplies	1.38
Principal operating expense, total	35.09
Total expense of motor-train operation, exclusive of relief-train maintenance and operation	52.45
Total expense, including relief-train maintenance and operation	55.39
Cost of equivalent 100 per cent steam-train operation	84.70
Saving, due to motor car operation	29.31

in an average of 1.4 miles per gal. On the basis of the 34-month period the average cost of motor-train operation per passenger-train-mile is shown in the table.

Inspection and Maintenance

Up to the present time there has been no occasion to make heavy repairs to these cars. The principal re-

pair point on the Cincinnati Northern is at Van Wert. As the runs are now arranged, one car lays over night at Cincinnati, another at Jackson and the remaining two at Van Wert. This overnight layover period is utilized to make a thorough inspection of the cars and to make light running repairs. Any heavier repair work is performed in the 36-hr. period between 8:30 p. m. Saturday and 6:00 a. m. Monday. Each car makes an average of 1,500 miles a week and the oil in the engines is changed regularly once a week. The cars are pooled in service so that it is possible to cut out each of the four cars for an overnight layover at Van Wert once a week for oil change.

The maintenance of the mechanical equipment has consisted principally of regrinding the valves in the engines and cleaning the carbon out on an average of about once each 12,000 miles.

Proposed Coal Legislation Inimical to Railroads

WASHINGTON, L. C.

OPPPOSITION to provisions of the bill now under consideration by the Senate committee on interstate commerce for the regulation of the bituminous coal industry, with particular reference to authority proposed to be conferred on a bituminous coal commission which would affect the interests of the railroads, was expressed by C. S. Duncan, economist for the Association of Railway Executives, at a hearing before the committee on January 16.

The bill would authorize the coal commission to investigate the fuel service of railroads and would prohibit a railroad from building any siding or switch, or from cutting its lines for any siding or switch to any bituminous coal mine or tippie, until after it has received permission from the Interstate Commerce Commission to do so, with a provision that such permission shall only be granted upon approval of the coal commission. Dr. Duncan summarized the specific objections from the standpoint of the carriers as follows:

1. It would interfere with the supply of railroad fuel. The carriers are responsible for safe and continuous operation regardless of any inadequacy that may exist in the supply of coal. In making purchases, therefore, the first consideration must be continuity of supply. So far as Senate Bill 4490 is concerned, the railroads' experience during the World War and subsequently, leads to the conclusion that, since the allocation of the purchases of coal by carriers which require a suitable character of coal would be beyond the control of railroad management, the operation of this bill would interfere seriously with the continuity of their fuel supply.

2. It would increase railroad operating costs. No one will dispute that this bill aims to increase the cost of coal and thereby increase the cost of railroad operation. It takes from railroad management its right to purchase this commodity without restrictions, a freedom in the exercise of managerial judgment which the carriers have with respect to all other commodities that they buy. The language of this bill is very indefinite but, as we understand it, it is intended to give to the contemplated coal commission the right to dictate to the carriers at which mines they may secure their coal. This would place the buyer at the mercy of the seller and would, no doubt, result in exorbitant demands and continuously increasing prices for railroad coal. It is to be observed, furthermore, that there is no provision here requiring the coal producer to sell to the railroad, thus limiting and restricting the power of the carriers as purchasers of coal, while leaving other purchasers and the seller free.

With the carriers as a whole earning considerably less than the rate of fair return established by law, the resulting increase in cost of fuel would no doubt have to be made up by an increase in rates.

3. We are also advised that the provisions of the bill constitute an invalid invasion of the carriers' freedom of contract. The attempted restriction in this bill on the right of purchase has no such relation with legitimate regulation as to bring this bill within the power of Congress to regulate commerce.

Commissioner Porter Working on Consolidation Plan

WASHINGTON, D. C.

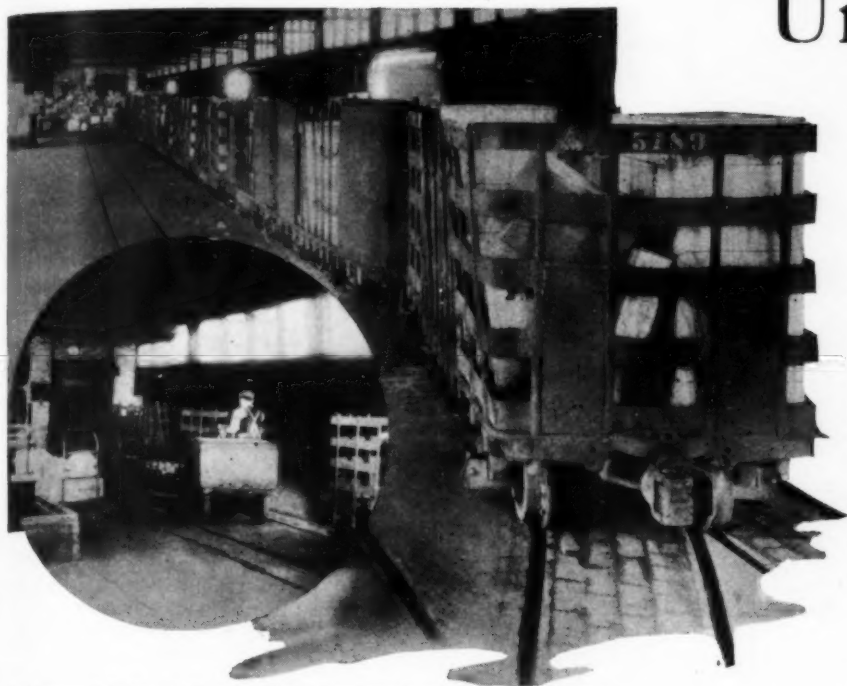
WHILE efforts are still being made, with scant prospects of success in the near future, to induce Congress to act on a railroad consolidation bill which would remove the present direction to the Interstate Commerce Commission to prepare a complete consolidation plan, Commissioner Porter of the commission is going forward with efforts to prepare such a plan in accordance with the provisions of the present law, for submission to the commission. For four years the commission in its annual reports to Congress has recommended legislation which would omit the idea of a pre-conceived plan with which unifications to be proposed by the railroads must harmonize to obtain approval, and its reiteration of the recommendation in its report submitted in December represents its latest official word on the subject.

Commissioner Porter, however, believes that in the absence of action by Congress the commission is still under the injunction of the law passed in 1920 and that it ought to be making some progress in that direction. It is understood, also, that some other members of the commission agree with him but that the commission has taken no action in the matter since it assigned the subject of consolidation to his docket last Spring, shortly after he became a member of the Commission to succeed Commissioner H. C. Hall. Commissioner Hall, who presided over the hearings on the tentative plan promulgated in 1921, was chairman of a consolidation committee of the commission, but there have been no meetings of such a committee for several years. A recently published press report gave an impression that the commission had officially decided, in spite of its recommendations to Congress, to go ahead with the preparation of a plan without waiting longer for legislation. It is authoritatively stated, however, that no such action has been taken by the commission and that the implied inconsistency between such a step and its repeated recommendations to Congress cannot be attributed to it.

Little Prospect for Further Action

However, there seems little prospect that Congress will take any further action on the Parker or Fess bills at this session of Congress and the expected special session, to begin shortly after Mr. Hoover becomes President, is intended to be devoted mainly, if not exclusively, to farm relief and tariff legislation. Meanwhile the consolidation question is expected to be brought before the commission again in an insistent way by a formal presentation to it of the "four-system plan" for a grouping of the eastern railroads. Although the roads have not been able to reach a complete agreement, it is reported that the Van Sweringen interests and the Baltimore & Ohio, at least, are preparing to ask the commission's approval of the allocation of certain roads to them, including some in which they have no present interest, as well as those in which they have acquired a stock interest.

Chicago Freight Speeded Up By Underground Railroad



Underground Railroad Connects with Transcontinental Freight House

Over 1,000,000 tons of merchandise, coal, cinders and excavating material handled in a year

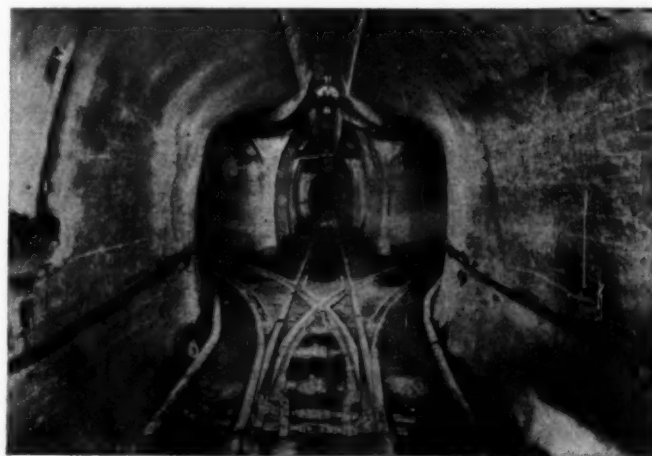
Tunnel Company, was formed to take title to the property. The properties of the Chicago Warehouse and Terminal Company were restored to it and the two properties have since been operated practically as one system by the two corporations whose stock is owned by the Chicago Tunnel

Terminal Corporation. The tax rate fixed in the tunnel franchise called for the payment of five per cent of the gross receipts of the company during the first 10 years, eight per cent during the next ten years, and 12 per cent thereafter. In addition, the Chicago Tunnel Company pays real estate taxes, as does the Chicago Warehouse and Terminal Company.

Train Movements Controlled by Dispatcher

There are 62 miles of tunnels and connections, all equipped with 2 ft. gage track and overhead trolley wires for the use of electric locomotives. There are 734 intersections. Electric power is furnished at 250 volts, d-c. from four sub-stations and 11 sections.

The tubes are 6 ft. wide inside and 7½ ft. high and are shaped like a horseshoe. They are bored through a stratum of blue clay and the walls are faced with concrete a foot thick.

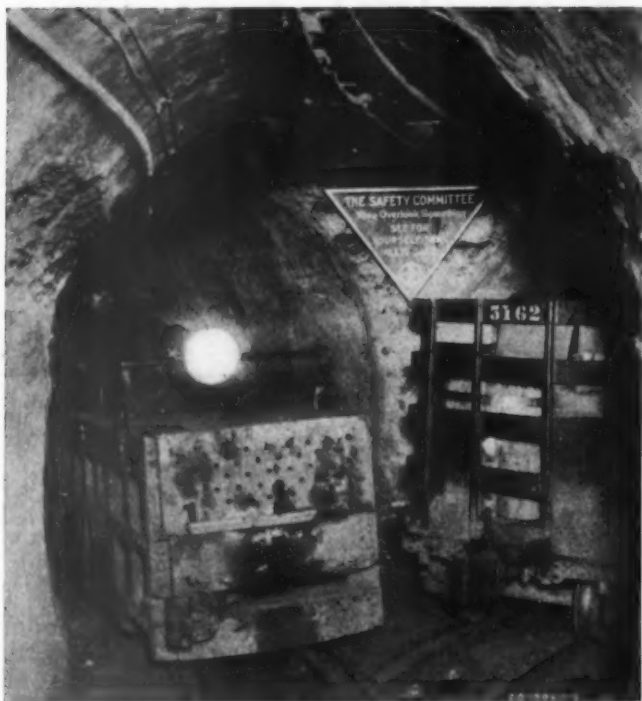


A Four-Way Intersection and Three-Way Switch

FREIGHT deliveries between railroad stations and industries in Chicago are speeded up by an underground railroad which operates in tunnels 40 ft. below the surface of the business section. This railroad, which has 62 miles of 24 in. gage track, is owned and operated by the Chicago Tunnel Company and the Chicago Warehouse and Terminal Company. The equipment consists of 150 electric locomotives, and 3,304 cars, which handled 600,972 tons of merchandise, 57,440 tons of coal, 58,884 tons of cinders, and 301,642 tons of excavation and refuse during 1927. The road has 49 connections with railroads, 4 universal public less than carload freight stations, 26 private merchandise connections, 40 coal and cinder connections, 16 cinder connections, and 3 coal receiving stations. About 580 people are employed, while the payroll amounted to \$957,873 last year.

The construction of the tunnel railroad was begun in 1901 under a franchise granted by the city to the Illinois Telephone & Telegraph Company for the purpose of housing telephone and telegraph wires and cables. In 1903, after 20 miles of tunnels had been constructed, the properties were sold to the Illinois Tunnel Company which was empowered to handle merchandise and packages and to build tunnels of a specified size. In 1904 another company, the Chicago Warehouse and Terminal Company, was organized to build tunnels under railroad and private property and connecting shafts and elevators to buildings, railroad freight houses, shippers' premises and universal freight stations.

In 1909 the work of construction was completed, rolling stock and equipment purchased and operations begun. About \$30,000,000 had been expended. On December 1, 1910, receivers were appointed and on May 1, 1912, the properties and franchises of the Illinois Tunnel Company were purchased by the reorganization committee and a new company, the Chicago



There Has Never Been a Major Accident in the Tunnels

As a provision against dampness, there are 63 electric pumps and a complete system of pipes which are connected to 1,100 sumps, from which any accumulations of water are raised to the sewers above. These provisions, combined with a ventilating system, keep the floors dry and clean and maintain a constant temperature of 55 deg. The air in the tunnels is drawn up through shafts for the ventilating and cooling of many buildings and theatres. Waterproof and fireproof doors are provided to isolate connections with buildings and commercial terminals from fire or water from above.

The tunnels are lighted at all connections and elsewhere when other than the train lights are needed. Signal lights protect the trainmen when delivering or switching cars. Glass reflectors at all intersections give

warning of an approaching train from lateral lines. Electrically-lighted signs announce "curve ahead" and warn to "go slow" or "come to full stop." Each "river drift" is protected by an automatic block signal. Signs at the corners show what streets one is under. A total of 3,800 lights are used.

All train movements are controlled by a train dispatcher in the central station. He has over 300 telephone connections with the tunnels and keeps a dispatchers' sheet of train locations and movements. There is an average of about 300 train movements a day while a train consists of about 15 cars.

The rolling stock comprises 150 electric locomotives and 3,304 freight cars, including 2,693 merchandise cars, 151 coal cars, 400 excavation and cinder cars, and 60 company service cars. The usual car is open and fitted with stakes and bands to protect the load. The car is about 4 ft. wide and 12 ft. long and will carry from one to six tons, depending on the commodity. The coal cars hold four tons and those used for the disposal of excavated material and cinders hold $3\frac{1}{2}$ cu. yards.

Of the larger commercial houses, 24 have direct individual connections with the tunnel-railroad through the facilities provided by the Chicago Warehouse and Terminal Company. These connections consist of tunnel approaches, switches, tracks, shafts and elevators for lifting cars to the level of the street floors. With one exception these are used only for the shipping and receiving of freight transported through the tunnels to and from railroad freight terminals.

Largest Business Is With Railroads

The largest business of the underground railroad is with above-the-ground railroads. Two thousand tunnel-railroad cars of freight are delivered to the various steam railroad terminals daily and 800 cars are loaded for delivery to local consignees and other railroads. In a year the tunnels interchange, with other railroad freight terminals, about 650,000 tons of package freight.

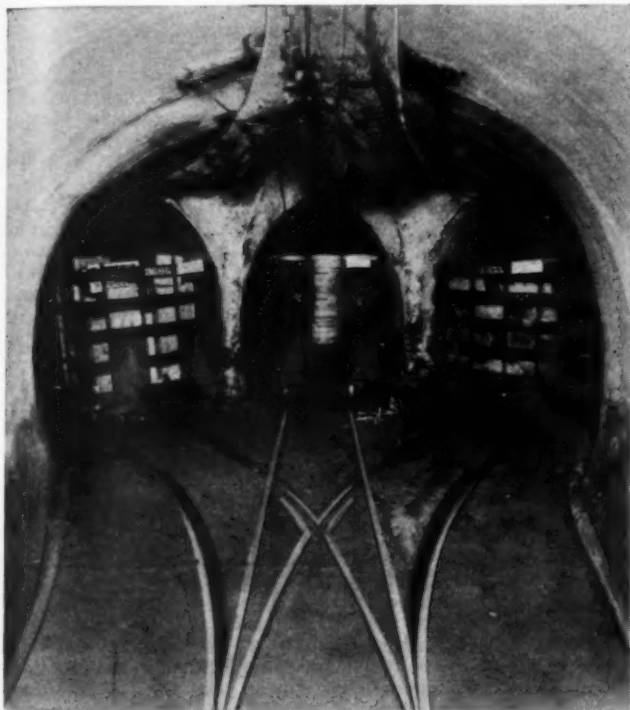
Connections with these railroad freight terminals are universal. They are similar to those in use at commercial houses but have larger track facilities. The underground railroad facilitates the delivery and collection of freight for shipment on other railroads for



A Platform at a Universal Freight Station

without the underground service, the business of thousands of shippers would be sent direct to the freight terminal by trucks, thereby adding the equivalent of 5,000 vehicles to the street traffic. This would also congest the railroad team yards and receiving doors while the additional business on the surface would, in many instances, necessitate additional facilities at the railroad terminals.

The Chicago Tunnel Company's four public receiving stations, known as universal freight stations, are outside the "loop," but each of them is strategically located for business from that district. These stations are for the use of shippers who have no private connections with the tunnel right-of-way. At these sta-



Tunnel Branches Reach Stores and Warehouses

tions freight is received for shipment over all railroads. The Tunnel Company is a common carrier, subject to the supervision of the Interstate Commerce Commission and issues through bills of lading.

In the receiving of freight at one of these stations, the driver registers upon arrival with his load and the time is noted on the clerks' sheet. He gives the bill of lading for his load to the revising clerk who checks the routing. During the unloading, the tunnel clerk checks the freight against the bill of lading, which is then signed and returned to the driver, and the time is entered on the clerk's sheet. Shipping orders are manifested and travel with the freight from the tunnel station to the terminal of the railroad over which it is routed. At the universal stations, freight for forwarding over several railroads and for several destinations may be received from the truck. The tunnel-railroad force sorts it and delivers each consignment to the railroad designated. The shipper or his representative completes the entire task of shipping at the tunnel station. Freight delivered at a tunnel-railroad station by 2 p.m. is delivered to the steam railroads in time for shipment before 5 p.m.

Service To Be Extended

The tunnel company is experimenting with a plan for picking up freight at points distant from its univer-

sal stations and off the tunnel-railroad routes. It has a tractor-trailer truck service for shippers so located and for which an extra charge is made.

Many commercial houses and office buildings have tunnel-railroad connections for coal and cinder service. One coal company has the tunnel service in the yard and makes its "loop" deliveries through the tunnels. Others have their coal cars placed at the tunnel chutes, unload into the chutes whence coal is delivered by the tunnel-railroad cars to the boiler rooms of buildings as it is ordered.

Several other uses are made of the tunnel. These include the movement of excavation, the daily average of haul of new buildings excavation being between 200 and 300 cars. Pneumatic tubes which carry messages and newsmatter from the offices of the City Press Association to daily newspapers are located in the tunnels. The underground railroad at one time was used for the delivery of mail between the postoffice and railroad stations.

Joint Barge-and-Rail Rates Are Prescribed

WASHINGTON, D. C.

THROUGH routes, maximum joint differential barge-and-rail rates, and reasonable divisions of such rates on traffic between New Orleans and Mobile on the one hand and points on the Southern Railway System on the other hand, moving over the Warrior River division of the Inland Waterways Corporation via Birmingham, Ala., are prescribed by the Interstate Commerce Commission in a report made public on January 23 on the complaint filed by the federal barge line.

The text of the findings in the report by Commissioner Eastman, and a concurring opinion by Commissioner Woodlock in which he discusses the subsidizing of the users of the water line at the cost primarily of the rail carriers, follows:

We find that it is desirable in the public interest that through barge-rail routes be established by complainants and defendants via Birmingham, Ala., between New Orleans, La., and Mobile, Ala., on the one hand, and the points described in the complaint on the lines of defendants in Tennessee, Alabama, Georgia, North Carolina, South Carolina, and Virginia, on the other hand, in all instances where (1) the shortest distance over defendants' lines between the interior point and Ensley, Ala., plus the shortest distance by rail between Ensley and Mobile or New Orleans, as the case may be, does not exceed by more than 40 per cent the shortest distance by rail between the interior point and Mobile or New Orleans, as the case may be, and where (2) the shortest distance over defendants' lines between the interior point and Ensley does not exceed three-fourths of said shortest distance between the interior point and Mobile or New Orleans, as the case may be.

We further find that it is desirable in the public interest that joint rates applicable locally on domestic traffic be established and maintained by complainants and defendants over the barge-rail routes described in the preceding paragraph, and that, subject to the exceptions noted below, such rates should not at a maximum exceed rates determined in each instance by deducting from the lowest corresponding rate, class or commodity, applicable in the same direction over a route between the same points in which a defendant participates, 20 per cent of the similar corresponding rate between Ensley and Mobile or New Orleans, as the case may be, where the excess under (1) in the paragraph above is not more than 20 per cent and the fraction under (2) above is not greater than two-thirds, and by deducting 10 per cent in all other instances; *provided, however*, that this finding shall not apply where the all-rail rate over the direct route from or to the interior point to or from Mobile or New Orleans, as the case may be, involves at intermediate points departures from the long-and-short-haul

provision of the fourth section of the interstate commerce act, and *provided, further*, that where free storage in transit is provided by the Inland Waterways Corporation in connection with the barge-rail rate, the maximum for the latter on shipments so stored shall be the lowest corresponding all-rail rate without deduction of any differential.

We further find that, with the exception noted below, just, reasonable, and equitable divisions, as between complainants and defendants, of the joint barge-rail rates above found desirable in the public interest will be determined on a rate prorate basis, i.e. by dividing the rates at Ensley in proportion to two factors, the factor determining complainants' share to be 87.6 per cent of the first-class rate between New Orleans and Ensley or 89.7 per cent of the first-class rate between Mobile and Ensley, as the case may be, and the factor determining defendants' share to be the first-class rate under the Southern Scale for the distance over defendants' route between the interior point and Ensley; *provided, however*, that in the case of barge-rail rates on cotton or cotton linters compressed in transit, there shall first be deducted from the rate, before applying the rate prorate basis above described, 15 cents for compression service and 3 cents for transit service, these amounts to accrue to the carriers performing those services, and that in no event shall defendants receive less, exclusive of the compression charge, out of the joint rate than 50 per cent of its amount after deducting the compression charge. This was the basis approved on cotton in the *L. & N. case* and 144 I. C. C. 431.

With respect to terminal charges, such as switching, drayage, and the like, complainants propose that the originating or delivering carrier shall assume its own terminal disabilities. Defendants make no objection to this plan. It was approved in the *L. & N. case* and we likewise approve it here.

Complainants also ask us to prescribe reasonable per diem rules and regulations to cover the detention of equipment at the point of interchange. It is understood that the arrangement sought by the barge line is in effect with the Southern at Memphis, and with other carriers at other points of interchange. It seems probable that no difficulty will be experienced in reaching an amicable agreement as to this matter, and no finding with respect to it will therefore be made at this time.

Inasmuch as the parties may find it desirable to depart in minor respects from the adjustment above prescribed, no order will now be entered, but if the parties are unable to reach an agreement with respect to the matters in issue within 60 days after the date of service of this report, we shall upon request of either party consider the entry of an order. If need for fourth-section relief arises in connection with the rates above prescribed, appropriate applications should be filed.

WOODLOCK, Commissioner, concurring:

It is the declared policy of Congress that inland waterway transportation, like rail transportation, shall ultimately be left to private enterprise. The Inland Waterways Corporation owned and operated by Government, is therefore nothing more than an experiment, the object of which is to demonstrate to private capital that inland water transportation is an economic service, i.e., that it can support itself on rates sufficiently low to attract the necessary traffic. In its experimental stage it is being supported by the people's taxes. It is, however, further, the declared policy of Congress that water lines shall have certain advantages as against the rail carriers, e.g., a differential under rail rates, through water-rail routes, and, finally, "maximum" joint rates on the level of existing all-rail rates, differential considered, regardless of whether the latter are "reasonable" maxima or not. These advantages are in fact a subsidy to users of the water lines at the cost primarily of the rail carriers. Theoretically, no doubt, the latter are protected in their revenues by section 15a of the act.

The report in the instant case—as also that in Docket No. 11893 (to which also this expression applies) exhibits in clear relief this process of subsidization of shippers using the water lines.

In the first place, there is the basic differential in the port-to-port rates of 20 per cent. This was fixed during the war, and we have accepted it, as the report says, "as reasonable." Beyond this prescriptive status I see no other ground upon which judgment may be formed as to whether it is reasonable or not. But it is a fact. Next, there is the compulsion of rail carriers to join with the water lines in through routes and joint rates to virtually all points that those lines may desire, regardless of "public convenience and necessity," and the prohibitions of short hauling. A recent decision by the Supreme Court with respect to rail carrier through routes throws some light upon the magnitude of this concession. Finally there is the prescription of "maximum rates" over these

water-rail routes on the basis of existing all-rail rates, differential considered, whether these existing rail rates are, in fact, "reasonable maximum rates" or not. (While I am quite unable to follow the report in its reasoning in support of this prescription, I agree that this prescription is necessary and in clear accord with the expressed intent of Congress.) These are substantial handicaps upon the rail carrier competitors of the water lines especially with Government money at present backing the principal water lines.

Granted that it is the desire of Congress to subsidize permanently in these ways the users of water transportation service, there remains the important problem of the experimental Government owned and operated water-line service conducted by the Inland Waterways Corporation. It is of the utmost importance to the public that the progress of this experiment should be most carefully and continuously scrutinized to the end that the degree of success obtained shall be made perfectly plain. For this complete and accurate statistics of costs, both investment and operating, should be made available. We should be in a position to judge with no small degree of accuracy whether this experimental service is in fact in the way of becoming a true economic service, or whether it is not. At present this information is not available. I can think of no good reason why it should not be made available, nor do I imagine that so to make it involves any great difficulties. The public has a right to know the results of the experiment for which its money is being spent.

The report in the instant case, and that in Docket No. 11893 seem to me to be in the main sound. Having always in mind that Congress is definitely opposed to permanent governmental ownership and operation of transportation service, either by rail or water, it becomes the manifest duty of this Commission in giving effect to the special advantages above described which Congress has accorded to the water lines, to construe the statutes in as strict accordance as possible with sound economic principles. These reports reflect an earnest, honest and frank attempt so to construe them. Without being prepared to say that in all details they are wholly successful in this respect, I think they have attained a considerable measure of success, and for that reason I concur in them. We must, however, remember that whatever may be the expressed intent of Congress to favor the users of water-line transportation service in a special way, it is equally the expressed intent of Congress that the rail carriers shall be maintained in full vigor and in full capacity to render adequate transportation. If the users of water transportation are to be favored as against the users of rail transportation, the users of rail transportation must, in accord with the intent of Congress, and the terms of the law, bear whatever burden is entailed thereby. There is no other place where that burden may lawfully be imposed. This is something which, under the law, this Commission must bear in mind in giving effect to the terms of section 15a.

The commission has also issued a report on further hearing prescribing the bases of divisions of joint rail-barge and rail-barge-rail class and commodity rates between points on the Baltimore & Ohio in central territory and lower Mississippi river ports, Mobile, Ala., and interior points in Arkansas, Louisiana and Texas. In a former report the commission indicated the general principles which should govern the division of joint rates between the federal barge line and defendant rail carriers, but, following negotiations, there was a disagreement between the barge line and the Baltimore & Ohio. The findings are as follows:

We find that the present divisions of joint rail-barge rates between lower Mississippi River ports and Mobile, on the one hand, and stations on the Baltimore & Ohio in central territory in so far as they are involved in this proceeding, on the other hand, via St. Louis, Mo., and Cairo, Ill., and of joint rail-barge-rail rates between interior points in Arkansas, Louisiana, and Texas, on the one hand, and said stations on the Baltimore & Ohio, on the other hand, via St. Louis or Cairo and lower Mississippi River ports, are unjust, unreasonable, and inequitable.

We further find that just, reasonable and equitable divisions of the aforesaid joint rates, so far as here involved, will be arrived at by the following method:

To the all-rail rate corresponding with the rail-barge or rail-barge-rail rate to be divided, apply a rate prorate, using the following factors:

For the Baltimore & Ohio, the first-class rate under the scale shown in the appendix for the distance covered by its haul, minus 15 cents.

For the Illinois Central or any other intermediate carrier in central territory, the first-class rate under the scale shown in the appendix for the distance covered by its haul, minus 30 cents.

For the rail haul between the barge line's ports, the existing first-class rate, minus 15 cents when it is an originating or delivering carrier and minus 30 cents when it is an intermediate carrier.

For any delivering or originating rail carrier in the Southwest, the first-class rate under the southwestern scale for the distance covered by its haul, minus 15 cents.

For any intermediate rail-carrier in the Southwest, the first-class rate under the southwestern scale for the distance covered by its haul minus 30 cents.

The divisions so arrived at for the Baltimore & Ohio and any intermediate carrier in central territory shall be their divisions out of the rail-barge or rail-barge-rail rate to be divided, and the balance of said rate, after deducting such division of the Baltimore & Ohio and such division of any intermediate carrier in central territory, shall accrue to the barge line and any rail carriers in the Southwest participating in the rate. No finding is herein made as to the division of this balance between the barge line and any participating southwestern carrier or carriers, as it is our understanding that that question is not here in issue.

Eastern Safety Conference

SAFETY superintendents and other representatives of railroads in the eastern region met at the Commodore Hotel, New York City, on Tuesday, January 15, in their third annual mid-winter conference. Charles E. Hill of the New York Central, chairman, presiding. There was a full attendance of safety department representatives; and also many superintendents, trainmasters and other operating officers, making altogether an attendance of about 300. The discussions covered questions of safety in connection with collisions and derailments; train service accidents to road employees; train service accidents to yard employees; safety among trackmen; safety in the shop, and other questions.

Collisions and Derailments

The leading paper was on causes of collisions and derailments, by John A. O'Boyle, a trainmaster of the Lehigh Valley. Mr. O'Boyle said that in his service of ten years as trainmaster, including one year on a single-track division, he had had only one collision outside of yards and none with casualties within yards, so he could not say much from personal experience; therefore, he quoted facts from recent reports of the Bureau of Safety, I. C. C.

Prevention instead of cure must be the watchword. In the selection of employees the officer must carefully cover all questions of mental capacity. Conditions are improving and competent men are not so scarce as formerly. A new man in train service must be put in charge of an experienced man who is peculiarly fitted for giving instruction. Men on the Lehigh Valley are examined every two years, and at these examinations attendance on the part of employees is compulsory.

Derailments as well as collisions are sometimes due to lack of vigilance on the part of trainmen. The Lehigh Valley rigidly enforces the rule that one or more men must be at the head end of a freight train as it starts out, and the train must be moved slowly enough to permit efficient inspection of the cars as they pass the man standing on the ground. Employees, including conductors, are disciplined for neglect in this inspection whether the negligence does or does not result in a derailment. On 90 miles of road, double track, there has been no major derailment in four years; trainmen and others have discovered defects and prevented a number of accidents. The officer in charge must rigidly in-

sist on "trouble-making" cars being cut out before a freight train leaves the yard. In keeping air brakes in perfect order, with just the right piston travel, and in keeping hand brakes efficient, there is still room for much improvement.

In the discussion on this paper, H. E. Baily, superintendent of the New York, New Haven & Hartford, New York City, told of his experience on the New York Division of that road—a four-track main line with several branches. Like Mr. O'Boyle, he had had but little experience with collisions, and so referred to the government reports. The rule of the New Haven requiring trains always to restrict speed *at or before* the time of passing the distant signal, is highly satisfactory. If we can make sure that the engineman is alert at the caution signal, there need be no anxiety about what he will do at the stop signal. With the cautionary signal a long distance back from the stop signal the chance that an engineman may forget that he is running under caution is always present, unless he *acts caution* at once, when he sees the signal. The "dead man's handle" with which power is shut off if the engineman removes his hand, which is used on the electric motors in passenger service on the New Haven, is being introduced also on the motors which haul freight trains; but on freights there is no emergency application of the brakes.

Mr. Baily has 300 surprise tests a month. Side collisions entering or leaving side-tracks constitute a special danger to be guarded against. Frequent inspections will keep trainmen alert. The rule that in case a derailment fouls an adjacent track, flags must be sent out on that track, is one the neglect of which must be guarded against. Not since 1910 has Mr. Baily had any trouble from derailments on adjacent tracks. The rule to require freight car doors always to be closed requires constant attention. If a door of an empty car cannot be kept in place by ordinary means, it must be made fast with nails. Open cars carrying freight secured by stakes and wires should be placed near the caboose where they can be constantly watched. Inspections of such cars should be carefully recorded, in detail at departure yards.

Train Service and M. W. Accidents

Causes and remedies to road employees in train service accidents were discussed in a paper by G. B. Elmhurst (Penn.); train service accidents to yard employees by M. L. McElheny (B. & O.); and causes and remedies of accidents to employees in maintenance of way by E. M. Boots (P. & L. E.). George A. Silva (B. & M.) spoke on safety in the shop.

Rowe, Bentley & Carrow

H. A. Rowe (D. L. & W.) chairman of the Committee on Highway Crossing Accidents, reported that his committee is preparing for the usual campaign the coming summer and urged all roads to make liberal use of the posters and the booklets which the committee prepares. Last year the railroads used 596,000 posters and nearly as many booklets, but many more ought to be used; "use them by the millions!" said Mr. Rowe. Railroad officers were again reminded that the problem of safety at crossings is not wholly for the benefit of the careless motorist; 30 railroad employees have been killed in a single year in crossing accidents. The last annual record shows 70 persons killed and 225 injured, classed as other than automobile passengers.

L. G. Bentley (C. & O.), chairman of the Committee on Education, made a brief review of his work for the past year. Of the safety bulletins issued, month by month, 18,000 copies were used; much more than this

number ought to be used. Calling attention to the seven-year campaign, he said that, since 1923, the Pennsylvania had reduced total casualties to employees on duty 72 per cent; the New York Central has reduced 56 per cent and the Baltimore & Ohio 45 per cent; and other roads have shown less striking improvement. The record of employees killed (as distinguished from injured) is a feature of the safety specialist's work still calling for more intensive study.

Thomas H. Carrow, of the Pennsylvania, in a brief address at the close of the meeting, made a stirring appeal for more energetic effort to cure the deficiencies of employees before they cause an accident, to themselves or others, instead of after. The division engineer or roadmaster, employing 10, 50 or 100 track foremen, makes the necessary inquiry or study to fix in his own mind a satisfactory estimate of the competence and abilities of each of those foremen; this is a most obvious duty for a man in his position. Why is it not equally the duty of the track foreman to do his best to follow this example, in relation to each individual workman in his gang? It is a simple duty to distinguish the safe from the unsafe man; every man should be classified as good or bad. To the extent that this ideal has not yet been found completely attainable, the foreman has a duty constantly to study his men and to take all possible measures to improve them. These observations concerning track work apply with equal force to the shop foreman, and to all employees having supervision over other employees. If a man's careless acts in minor matters, or his careless habits of thought, are by any means discoverable it is a duty to discover and correct.

Santa Fe Reading Rooms

FROM a small beginning 30 years ago, the Atchison, Topeka & Santa Fe has now built up a group of 23 reading rooms and clubhouses at various points on the system for use by its employees. The progress made in increasing the facilities is indicated by the accompanying photographs showing the reading rooms of 20 years ago and of today at La Junta, Colo., and Needles, Cal.

The popularity of these reading and club rooms is indicated by a recent survey of the activities which showed that during one month 18,605 beds were used, 1,184 baths were taken, 2,992 employees played pool, 738 dominoes, 196 chess and 25,564 consulted newspapers, periodicals and books.

The plan was inaugurated on November 1, 1898, when Rev. S. E. Busser was appointed superintendent of reading rooms for the Santa Fe system. Rev. Busser had



The Present Reading Room at La Junta, Colo.

conceived the idea of establishing recreation rooms along the Santa Fe lines, where employees could gather while off duty and have access to good books, the latest newspapers and periodicals and develop social acquaintances.

At first a few small rooms were provided, generally in wooden shanties, which were comfortable enough, but hardly to be compared with the present luxurious quarters, which are the outgrowth of the vastly increased popularity of the rooms. These early reading rooms were equipped with libraries and publications, and now and then a pool table, but as time went on and greater interest was shown by employees, these facilities were improved and a number of large buildings erected until today there are 23 reading rooms, or clubhouses, located as follows:

Chillicothe, Ill.
Shopton, Iowa
Marceline, Mo.
Chanute, Kan.
Newton, Kan.
Dodge City, Kan.
La Junta, Colo.
Purcell, Okla.
Waynoka, Okla.
South Shawnee, Okla.
Canadian, Texas
Slaton, Texas

Vaughn, N. M.
Belen, N. M.
San Marcial, N. M.
Raton, N. M.
Callup, N. M.
Winslow, Ariz.
Seligman, Ariz.
Needles, Cal.
Barstow, Cal.
Riverbank, Cal.
Somerville, Texas

The clubhouses now contain 480 beds, 68 baths, 38 pool tables and 75 card tables. The reading material supplied consists of 152 daily newspapers, 454 current periodicals and libraries containing approximately 1,000 books each, made up of fiction, poetry, science and general books of knowledge.

The majority of the employees visiting these clubhouses are away from home and include train and engine crews, signal men, engineering department employees and others whose duties necessitate traveling. They find in the reading rooms places to rest, spend the night and have access to late newspapers and periodicals, or to the various magazines provided. Of course, the employees who are located at the reading room points also visit them frequently. From the survey and reports from managers, it can be conservatively stated that the average daily attendance is between seventy-five and one hundred, which means that more than 50,000 employees use these facilities every month.

During four months out of each year entertainment is provided by musical organizations sent over the line at the company's expense for the purpose of giving



The Former Reading Room at La Junta



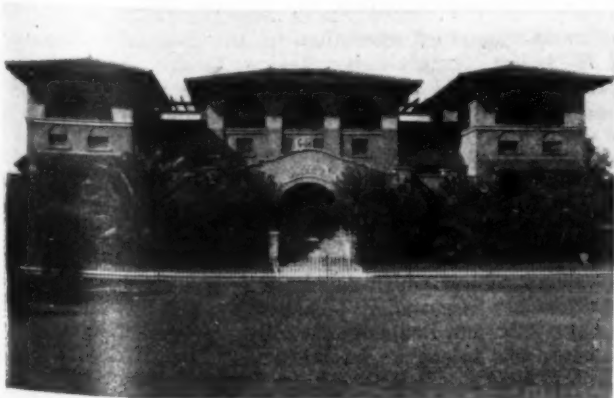
The Former Reading Room at Needles

concerts free of charge to employees and their families. During the 1928 season, 20 of these companies were sent out, and they gave a total of 181 concerts. This feature is enjoyed very much and tends to educate and entertain the people who do not have any other opportunity of enjoying this class of entertainment, since, in general, the reading rooms are situated in the smaller railway centers, which have no other facilities for entertainment.

More than 500 applications are received from chautauqua entertainers each year. In addition, many of the most noted singers and musicians who have a month or two without bookings, are glad of the opportunity of making a trip over the line, giving entertainments en route. The programs are varied as much as possible, so as to appeal to all tastes. They range from lectures by world-famous professors to jazz bands for dances, and from opera stars to college quartets.

These reading rooms have been established by the company to give employees and their families community centers in the more out-of-the-way places, in which they may, by the influence of good environment, good books and friendly association, develop social acquaintance that undoubtedly brings contentment and happiness. By surrounding its employees with every influence which will lead to a larger and better life, the company is trying to build up their character and put a premium on manhood, and thereby make better employees.

The policy of the reading rooms is democratic to the utmost, all employees, so far as these facilities are concerned, being treated alike. In other words, Santa Fe employees are looked upon as one big family, regardless of creed or position with the company, and they are permitted to use the reading rooms without discrimination, the idea being to make it a home for the employee. "First Come First Served" is the rule.



The Present Reading Room at Needles, Cal.

Looking Backward

Fifty Years Ago

The number of train accidents on the railroads in the United States was reduced to 740 in 1878 from 891 in the previous year and 1283 in 1873. Accidents attributable to broken rails were reduced from 111 in 1873 to 17 in 1878.—*Railroad Gazette*, January 24, 1879.

Records of car expenses kept by the superintendent of the machinery department of the Louisville & Nashville show that railroads may expect to save about 12 per cent in the original cost and cost of repairs in the use of iron freight cars as compared to wooden cars over a period of about 15 years.—*Railroad Gazette*, January 24, 1879.

The governor of the new state of Nevada states in his annual message that "there is no longer the color of an excuse for the legislature to neglect the passing of a stringent law to protect the business interests of the state against the extortions and unjust discriminations of the railroads." On January 1 the five railroads in the state had a main line mileage of 627.—*Railway Age*, January 23, 1879.

The Old Colony [now part of the New York, New Haven & Hartford] has negotiated a lease of the Boston, Clinton, Fitchburg & New Bedford for 999 years. The 151 miles of the latter's lines when added to the mileage of the Old Colony will make the combined mileage of 459 the greatest length under one management in Massachusetts.—*Railroad Gazette*, January 24, 1879.

Twenty-Five Years Ago

H. E. Byram, assistant to the fourth vice-president of the Chicago, Rock Island & Pacific, has been appointed general superintendent of the Western district, with headquarters at Topeka, Kan.—*Railway Age*, January 29, 1904.

A. C. Needles, hitherto superintendent of the Pocahontas division of the Norfolk & Western at Bluefield, W. Va., has been appointed general superintendent, with headquarters at Roanoke, Va.—*Railroad Gazette*, January 29, 1904.

Under the law passed by the last Dominion Parliament in Canada the office of Minister of Railways will soon be superseded by that of a railroad commission of three members, who will have absolute power to regulate passenger and freight rates. The commissioners are to be appointed by the governor general for a term of 10 years.—*Railway Age*, January 29, 1904.

By reason of its location, the Wabash will bear much the same relation to the St. Louis World's Fair that the Illinois Central bore to the Columbian Exposition at Chicago in 1893. The special service between the fair grounds and the Union Station contemplates the use of shuttle trains which will be able to handle 36,000 persons an hour, running at two-minute intervals with 10 cars, each capable of seating 120 passengers.—*Railroad Gazette*, January 29, 1904.

Ten Years Ago

As an indication of the conditions to be faced by the railroads if they are to be restored to their owners this year, preliminary estimates of earnings and expenses for 1919 which have been considered by Director General Hines and his staff are said to forecast a deficit of approximately \$250,000,000 for the year.—*Railway Age*, January 24, 1919.

The Pennsylvania Lines West of Pittsburgh have received from the builders several locomotives of the 2-10-2 type which are notable for the fact that their total weight is greater than for any engines of this type previously built, yet they are able to operate on 23 deg. curves. The weight in working order, without the tender, is 435,400 lb.—*Railway Age*, January 24, 1919.

Communications and Books

An Estimate of 1929 Carloadings

TO THE EDITOR:

PHILADELPHIA, PA.

Herewith is a tabulation of my estimate of total carloadings for 1929 according to which a total of 54,750,000 car loads is predicted for the year.

Actual carloadings for the year 1928 exceeded my estimate by 2.6 per cent. This was the fourth consecutive year for which I have made estimates. In each instance, actual carloadings have been close to the estimate, as shown in this table:

Year	Estimate	Actual	Per Cent of Actual to Estimate
1925	50,260,000	51,224,152	101.9
1926	53,352,000	53,098,819	99.5
1927	52,785,000	51,634,852	97.8
1928	50,250,000	51,576,731	102.6
Totals	206,647,000	207,534,554	100.4

The estimate of carloadings for 1929 by weeks follows:
Forecast of Total Revenue Freight Carloadings for the United States for 1929

Week Ending	Weekly Thousands	Cumulative Thousands	Week Ending	Weekly Thousands	Cumulative Thousands
J 5	781	781	J 6	934	26,571
12	915	1,696	13	1,112	27,683
19	930	2,626	20	1,118	28,801
26	925	3,551	27	1,129	29,930
F 2	919	4,470	A 3	1,141	31,071
9	917	5,387	10	1,142	32,213
16	918	6,305	17	1,132	33,345
23	873	7,178	24	1,137	34,482
			31	1,168	35,650
M 2	946	8,124	S 7	1,070	36,720
9	972	9,096	14	1,208	37,928
16	965	10,061	21	1,214	39,142
23	972	11,033	28	1,236	40,378
30	973	12,006			
A 6	933	12,944	O 5	1,254	41,632
13	998	13,942	12	1,237	42,869
20	1,002	14,944	19	1,240	44,109
27	1,013	15,957	26	1,242	45,351
M 4	1,030	16,987	N 2	1,202	46,553
11	1,047	18,034	9	1,118	47,671
18	1,052	19,086	16	1,111	48,782
25	1,084	20,170	23	1,124	49,906
			30	974	50,880
J 1	1,024	21,194	D 7	1,064	51,944
8	1,114	22,308	14	1,040	52,984
15	1,111	23,419	21	993	53,977
22	1,113	24,532	28	773	54,750
29	1,105	25,637			

WILLIAM AUSTIN.

New Book

The Economics of Rail Transport in Great Britain, by C. E. R. Sherrington. Bound in cloth, Vol. I, History and Development, 283 pages, Vol. II, Rates and Services, 332 pages, 8½ in. by 5½ in. Published in London by Edward Arnold & Co., and in New York by Longmans, Green & Co. Price: Each Volume \$5.

The author here presents a comprehensive treatise on British railways, commencing with an historical account of their beginnings and subsequent evolution into the systems of today and continuing to a discussion of current operating practices and governmental regulatory policies. Volume I is devoted mainly to the historical survey after its introductory chapter on the function of transportation in the economic scheme of the nation. Succeeding chapters sketch the evolution of each of the four amalgamated companies which comprise the main transportation systems of Great Britain today. The development of roadbed and rolling stock is next discussed while the volume closes with two chapters devoted to the beginnings and growth of governmental regulation.

Volume II opens with a chapter on the economic and social aspects of rail transportation and continues to an outline of British railway organizations, capital structures, revenues and expenditures. The workings of the Railway Clearing House

are explained as is the theory of British railway rates and their application. Then follows the discussion of operating practices including the principles of freight train, passenger train and yard operation, the workings of the English dispatching system and the economics of electric traction. Closing chapters consider the statistical reports required by the government, the competition of highway vehicles and the question of government ownership.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

The Ethics of Public Utility Valuation, by John A. Ryan. "The judicial theory of valuation" p. 5-10; "The Indianapolis decision and its implications" p. 11-19, "The just measure of valuation" p. 20-32. 32 p. Pub. by National Popular Government League, Washington, D. C. 25 cents.

Linking Rail and Air Transport, by W. W. Atterbury. A summary of Pennsylvania plans and developments to date. Illustrated. "Pennsylvania Railroad Information, December, 1928." 16 p. Pub. by Pennsylvania Railroad, Philadelphia, Penna., Apply.

New Cascade Tunnel, Great Northern Railway. Brief history of project, comparison with other large tunnels, engineering and construction features and program of coast to coast broadcasting of the dedication exercises, in a form extremely convenient for reference purposes. Illustrated. Map 20 p. Pub. by Great Northern Railway Co., St. Paul, Minn., Apply.

Notes on Half Round Sleepers (i.e. Cross-ties) of Sal and Teak, by W. A. Bailey, F. E. Cole and L. N. Seaman. "Wooden sleepers in America" pp. 31-36 includes extracts from articles by Earl Stimson, N. C. Brown and E. E. Pershall. Technical paper no. 269, Railway Board, India. 36 p. Pub. by Govt. of India Central Publication Branch, Calcutta, India. 12 annas or 1 shilling threepence.

The Story of the Baltimore & Ohio Railroad 1827-1927, by Edward Hungerford. Many will welcome this as a most important contribution to the history of American railroads properly provided with maps showing the progress of the road (1835, 1857, 1875, 1927) as end-papers, some will realize its value in the study of social and economic development, and above and beyond all this a few will value it as an interpretation of unconquerable spirit. Illustrations, maps, diagrams. 2 vols. Pub. by G. P. Putnam's Sons, New York City, \$10.00.

Periodical Articles

Legal Restrictions on Hours of Labor of Men in the United States. "The present article shows existing legislation regulating the hours of labor of men and gives a review of the decisions of the United States Supreme Court on the constitutionality of such legislation." p. 16. "Railroad employment" p. 22-23, 25. Monthly Labor Review, January 1929, p. 16-25.

"Recapture" and the Railroads, by Frederick Hanssen. Its present importance. Financial World, January 16, 1929, p. 78, 91.

Transportation History Through the Newspapers. Brief description of a series of remarkable scrap-books of newspaper clippings "some of them dating back to the beginning of the last century, on turnpikes, canals, stages, taverns, railroads, steamboats, ferries, ships and shipbuilding, coal, express-riders, and every subject which could conceivably have had anything to do with transportation, including the ubiquitous lottery." A hobby of the late Benjamin T. Hill of Worcester, Mass., these volumes now belong to the Business Historical Society, Baker Library, Boston. Bulletin of the Business Historical Society, January 1929, p. 8-11.

Odds and Ends of Railroading

Edward Smith, freight conductor of the Pennsylvania, Buffalo, N. Y., is among the first railway men to become licensed airplane pilots. George Stidham, engineman of the Southern at Valdosta, Ga., is another who has received his certificate as a flyer.

May Be Some Truth in This

First Trader—Can you give a reason for the big advance Canadian Pacific has been having?

Second Trader—I guess it is because they haven't any Interstate Commerce Commission up there.—Wall Street Journal.

The Height of Stubbornness

Press dispatches from Poland indicate a highly peculiar railway situation there. Official investigation of a recent head-on collision developed that the trains were sent together knowingly by two dispatchers, each of whom argued that his train had the right of way. The result of the argument was that four trainmen lost their lives and 33 cars were smashed.

Long Engine Runs

When the conversation drifts to long engine runs, the feat of Engineman H. S. Small and engine 149 of the old Central Pacific should not be forgotten. In 1876 Messrs. Jarrett and Palmer, chartered a special train from New York to San Francisco. Small hooked the 149 on the train at Ogden, Utah, and both the locomotive and the engineman ran through to Oakland, Cal., 883 miles, without relief. The run was made at an average speed of more than 36 miles an hour, through extremely mountainous country. It will always remain a remarkable feat of endurance of man and machine.

All the News, But No Editorials

One of this department's trusted representatives, who happens to be a signal department officer, observed recently an interesting instance of a Pullman porter disciplined in giving information, but not advice, to his passengers. During the course of the night, the car in which our informer was riding developed a hot box, and it became necessary to set it out, transferring the passengers to another car. The porter went through the car awakening the passengers: "Beg pardon, we have to change to another car at X——". When this news was imparted to a young woman occupying the berth across the aisle from our observer, she immediately asked: "Do I have to dress?" To this the porter vouchsafed no reply, other than: "We have to change to another car at X——". The young woman repeated her question and the porter replied in the same words. The third time the young woman asked her question, our spy, who up to this point had taken no part in the conversation, impatiently replied: "Use your own discretion, lady." Whereupon, putting his advice into practice, he hastily retreated.

The Height of Neighborliness

T. J. O'Meara of the Union Switch & Signal Company relates a yarn which, while exemplifying a well-recognized railroad characteristic, shows the existence of this trait in a somewhat exaggerated form. This railroad virtue is that of neighborliness. A certain railroad, says Mr. O'Meara, was installing signals. A frantic protest was received from the owner of an estate adjoining the tracks, asking that no signal bridge be installed where it could be seen from his dwelling; the owner did not want his "view spoiled by a lot of signals." The railroad graciously consented to accede to its neighbor's wishes. It instructed its signal department accordingly; so that one man from the signal outfit was stationed on the front porch of the house while another walked the track with a red flag attached to the top of a bamboo pole the height of the proposed bridge. By this method of observation the bridge was located where it could not be seen from the house. Unfortun-

ately, however, when autumn came and the leaves began to fall, the signal bridge was as plainly to be seen from the house as it would have been if it had been placed with no attempt at concealment.

Peculiar Accident Department

Eubrey Hardcastle of Indianapolis, is somewhat absent-minded, but he can hardly be criticized from the standpoint of physical agility. Eubrey was driving along, deep in thought of the Yogi philosophy, or something. Crossing bells were ringing, watchmen were yelling, a locomotive was whistling. In fact, all the protection that the Indianapolis Belt provides was going full blast, but to all of this Eubrey was oblivious. His first intimation that anything was wrong was when, coming out of his reverie, he looked up, and saw a large, heavy locomotive bearing down upon him. The fogs cleared from Eubrey's brain instantu. As the engine piled into his car, Eubrey squirmed out of the window and climbed onto the pilot. When the locomotive stopped and the crew ran up to pick up the remains, Eubrey was found, sitting on the pilot, sucking a small cut on his finger, and again deep in whatever thoughts automobilists think when they drive their cars in front of locomotives.

The Olden Days

Days when a brave woman could earn the applause of the country by yanking off her red petticoat and flagging a train just as it neared a broken rail are over, mostly because broken rails are rarer and red petticoats extinct. The New Jersey farmer who saved a train by waving a flag and a burlap bag, the other day, recalled those heroines of the past generation to mind, and, being given to idle speculation, we tried to picture the situation if a modern woman should come across a broken rail. If she removed a garment (any garment) to use as a flag, with the probabilities against her finding one large enough to be seen, the chances favor a horrible wreck, because a really modest engineer could do no less than close his eyes and speed past. Engineers, no doubt, favor a return of the good old days, in the interest of safety.—Columbus Dispatch.

Siberian Railroading

Railroad building and operation in Siberia are described by a returned traveler as follows:

"As the train slowly skirts the shores of Lake Baikal, that fathomless stretch of water appears and disappears as if seen through a series of giant windows. No spot along the rocky west side of the lake where a tunnel might be plastered onto the side of a cliff was overlooked. In some places, not finding anything to bore through, they built tunnels, mere sheds of stone and mortar, which stand out at varying distances from the rock.

"Later when the road was double-tracked, the tunnel-building enthusiasm had been dampened by the prison sojourn of the earlier contractors. The new line has fewer. While the eastbound track is a continuous succession of light and darkness, the westbound, only a few feet away and in many places separated only by the wall of a hand made tunnel, skirts the open shore of the lake for most of the distance. Trainmen say there are 48 tunnels, each varying in length from 20 feet to half a mile. I counted 51 and 133 miles and quit. The road itself does not know how many tunnels it owns. The old ferry barges on which trains formerly were towed across the lake in summer, big as floating drydocks, are tied to the banks and falling to pieces at Baikal station and Tankhoi on the opposite shore. The ferry crossed the lake 27 miles in 2 hours. The fastest trains, three times a week in each direction, now circle the end of the lake—145 miles—in 5 hr. 20 min., a considerably longer time. In winter tracks were laid on ice and the little freight cars were pulled across by horses. Locomotives were not trusted to the ice and passengers crossed in sleighs."



The Southern Pacific's "Sunset Limited" near Redlands, Cal.

THE CLEVELAND RAILWAY CLUB will hold its next meeting on February 4, at Hotel Hollenden, Cleveland, O. The discussion will be on the changes in the A. R. A. rules.

JOHN E. CURTISS, vice-chairman of the Nebraska State Railway Commission, has been elected chairman for the ensuing year, replacing Charles A. Randall, who takes Mr. Curtiss' place as vice-chairman.

THE NEW ENGLAND RAILROAD CLUB will hold its next meeting on February 12 at the Copley-Plaza Hotel, Boston. J. V. Neubert, chief engineer, M. W., of the New York Central, will read a paper on progress in track and roadbed work.

THE SENATE on January 16 adopted a resolution proposed by Senator Norris that the briefs of counsel and the transcript of record filed with the Supreme Court of the United States in the St. Louis & O'Fallon valuation case be printed as a Senate document.

THE NEW YORK RAILROAD CLUB will hold its next meeting on February 15 at the Engineering Societies Building, 29 West Thirty-ninth street, New York. The speaker will be A. G. Pack, chief inspector of the Locomotive Inspection Department, Interstate Commerce Commission.

THE OFFICERS of the American Railway Development Association are: President, H. W. Byerly (Northern Pacific) St. Paul, Minn.; vice president, M. C. Burton (A. T. & S. F.) Topeka, Kan.; second vice president, R. G. East, (Penn.) Shelbyville, Ind.; secretary-treasurer, E. L. Taylor, (N. Y., N. H. & H.) New Haven, Conn.

THE BOSTON & MAINE, having completed its program of strengthening bridges between Mechanicville, N. Y., and Portland, Me., now runs its largest locomotives, the "4000 Lima" series, through, between these cities, 270 miles, with 100-car freight trains. Enginemen are changed at Ayer, Mass., 150 miles from Mechanicville.

"LAYING OF STEEL is proceeding on the Hudson Bay line from Mile 356 to Fort Churchill and, if the work moves accord-

ing to schedule, steel will be into the new Hudson Bay terminus before spring," its was stated in Montreal by H. A. Dixon, chief engineer, central region of the Canadian National, who has just returned from a trip over the line as far as the "Barren Lands."

REPRESENTATIVES of the Province of British Columbia and the city of West Vancouver, B. C., have reached an agreement under which the Pacific Great Eastern is to contribute \$105,000 toward highway construction within West Vancouver, which will serve as a substitute for the operation by the railway of a suburban passenger service on its North Shore division, between North Vancouver, B. C., and Whytecliff, 13 miles.

THE AMERICAN RAILWAY ASSOCIATION has recently issued circular No. 2739 containing the report of the Joint Committee on Utilization of Locomotives and Conservation of Fuel. This report gives in a comprehensive manner a comparison of the accumulative totals and averages of operating statistics for the first nine months of 1928, compared with the same period of 1927 for Class I carriers. The trends in volumes and performance are shown and the circular contains information of value for anyone interested in the utilization of power and saving of fuel.

THE SOUTH LOUISVILLE shops of the Louisville & Nashville completed the month of November without a single reportable injury to any of the 4,000 men employed. The record of this shop during 1926, 1927 and 1928 shows unusual progress. In 1926, there were 287 reportable accidents, an average of 24 per month and in 1927, 220 or an average of 18 per month, while in 1928 there were only 30 reportable cases or an average of 2½ per month. The year 1928 showed an 86 per cent reduction over 1927 while the reduction for the system was 54.22 per cent.

U. S. Army Reserve Corps Appointments—Railway Units

William Godfrey Arn, assistant chief engineer, Illinois Central, with headquarters at Chicago, has been appointed lieutenant-colonel, Engineer Reserve.

Daniel K. Chase, master mechanic, Pennsylvania, with headquarters at Canton, Ohio, has been appointed captain, Engineer Reserve.

Conference on Motor Transport Bill

Chairman Parker of the House committee on interstate and foreign commerce held a conference on January 23 on details of his latest bill for the regulation of motor coach transportation with representatives of the principal interests concerned with such regulation, the operators and manufacturers of motor coaches, the state commissions and the railways. The conference was held in lieu of further hearings with the idea that greater progress might be made than at a public hearing.

Independent Motor Coach Wrecked—59 Per Cent of Passengers Killed

Nineteen passengers out of a total of 32 of an interstate independent long-distance motor coach were killed 1½ miles east of Bellevue, Ohio, on January 22, when the motor coach, enroute from Chicago to Pittsburgh, was struck and wrecked at a crossing by an inter-urban car of the Lake Shore Electric Railway, said to have been moving at about 35 miles an hour. All of the thirteen passengers not killed are reported as injured. In the electric car, two passengers were slightly injured. The electric car was enroute from Norwalk, Ohio, to Bellevue. The accident occurred during a snow storm.

Optimistic Equipment Outlook In Canada

At the annual meeting of shareholders of Canadian Car & Foundry Company, held in Montreal, the president W. W. Butler, said that up to the present there had been received new orders amounting to \$22,250,000 as compared with \$2,816,000 by the corresponding date last year. With less than three months of the fiscal year gone, and more than 9 months to go, there were more orders in sight still, and he was sure the company would receive

\$25,000,000 and would not be surprised if it did a business of \$30,000,000 in the current fiscal year. "I look on the future very optimistically," he declared.

Central Railway Club Annual Banquet

The Central Railway Club held its annual banquet at the Hotel Statler, Buffalo, N. Y., on January 10. The attendance was 1,100—the highest ever attained at this function. Frank M. Barker, superintendent of the Lehigh Valley and president of the club, acted as toastmaster and Samuel O. Dunn, editor of the *Railway Age*, was the principal speaker, his theme being the necessity for equality of treatment of all common carriers to replace the existing governmental discrimination against the railways. Entertainment included singing by the Pullman Porters Quartet of Chicago.

I. C. C. Appropriation Bill Passed by House

The independent offices appropriation bill, carrying appropriations amounting to \$7,496,289 for the Interstate Commerce Commission for the fiscal year 1930, was passed by the House on January 18 without any debate on the I. C. C. items. The bill provides that \$20,000 of the amount shall be immediately available, so that the commission may at once begin the training of the additional examiners provided for. The salary of the secretary is increased from \$7,500 to \$9,000. The Senate committee ordered a favorable report on the bill, without any change in the items affecting the commission on January 21.

The bill also provides for \$302,270 for the Board of Mediation.

Pennsylvania Celebrates At Norfolk

The opening of the extensive new freight terminal of the Pennsylvania at Little Creek, Norfolk, Va., which was completed on January 6, was celebrated on Thursday, January 10, by a public inspection of the plant followed by a dinner at the Cavalier Hotel, Virginia Beach, at which the railroad company entertained 250 citizens of Norfolk, Vice-president Elisha Lee acting as chief host. Among the speakers at the dinner, besides officers of the road, and Mayor S. H. Tyler, was Dr. Southgate Leigh, who appeared in the double capacity of surgeon of the Pennsylvania Railroad and president of the Norfolk-Portsmouth Chamber of Commerce.

Equipment Installed

Class I railroads in 1928 installed in service 58,395 freight cars, according to reports filed by the carriers with the Car Service Division of the American Railway Association. This was a reduction of 16,991 freight cars as compared with the number installed in 1927 and a reduction of 45,605 under 1926. Of the total box cars numbered 22,231; coal cars, 21,201, and refrigerator cars 4,502.

The average carrying capacity per freight car on January 1, 1929, was 45.9 tons as compared with 43.1 tons on January 1, 1923, or an increase of 6.5 per cent.

Freight cars on order on January 1 this year totaled 13,036, compared with 13,057 on the same day one year ago.

Locomotives placed in service in 1928 totaled 1,390, a reduction of 565, compared with 1927, and 1,009 under 1926. The average tractive power increased 5,898 pounds per locomotive or 15.6 per cent.

Class I railroads on January 1, 1929, had 147 locomotives on order compared with 93 on January 1, 1928.

These reports as to freight cars and locomotives include new and leased equipment.

N. Y. C. Shopmen Granted Higher Pay

Following the report of a Board of Arbitrators which was appointed last June and which has held protracted sessions, the shopmen of the New York Central, numbering about 16,500, were last week granted increases of pay amounting to about 40 cents a day. The board, acting under the federal law, filed its decision with the clerk of the United States Court in New York city and the increases are to take effect at once. The road and the employees had agreed to abide by the decision for at least one year. Machinists and the highest classes of workers in each trade, heretofore receiving \$6.08 a day are to receive 81 cents an hour, equal to \$6.48 a day. In all of the other classifications, the advance is 40 cents a day. The men received about one-third of what they asked for, except that the coach cleaners receive a flat increase of two cents an hour. The neutral members of the board were Julian W. Curtiss of New York city and Walter C. Clephane of Washington, D. C. The record of the proceedings of the board fills 4000 pages.

Piedmont & Northern Injunction Refused

The United States district court for the western district of South Carolina has dismissed the petition of the Piedmont & Northern Railway for an injunction against the order of the Interstate Commerce Commission (*Railway Age*, April 21, 1928, page 909) denying the road's application for a certificate authorizing the construction of two extensions of its electric railway system in North and South Carolina. The railroad attacked the commission's order on the ground that it is an electric inter-urban railway not subject to the commission's jurisdiction and also on the ground that the extensions were a part of the original undertaking, conceived before the passage of the law giving the commission jurisdiction over railroad construction. The court held that it should be classed as a railroad and that while the extensions might be said to have been part of the original conception of the promoters and not abandoned, that was not enough to constitute an

undertaking in existence before the passage of the transportation act.

Short Lines Hold Special Meeting

A special meeting of the American Short Line Railroad Association was held at Washington on Wednesday and Thursday, January 16 and 17, with an attendance of about 125 members, for the purpose of discussing pending legislation and other subjects of special interest. At a dinner at the Willard hotel on Wednesday addresses were made by Senator S. D. Fess, of Ohio, and Milton W. Harrison, president of the National Association of Owners of Railroad and Public Utility Securities. Senator Fess discussed the pending bills to amend the consolidation provisions of the transportation act but said there is no prospect of any action on them at this session of Congress, or at the special session proposed to begin about April 1, which is expected to be devoted to farm relief and tariff legislation.

President Bird M. Robinson reported to the members on the railway express contracts, the Pittman-Newton recapture bills, the Fess and Parker consolidation bills and the per diem case pending before the Interstate Commerce Commission. A special committee was appointed, with D. M. Swobe, president of the McCloud River Railroad, as chairman, to represent the short lines at the hearing before the commission on the express contract on January 24.

Aid for Inventors Urged

Dr. B. F. Wooding, of Denver, Colo., testified before a subcommittee of the House committee on interstate and foreign commerce in support of two bills introduced by Representative Newton, by request, one of which would provide for the creation of a board of engineers "to immediately provide the people with the best obtainable information after developing and testing inventors' promising inventions," and the other would provide for the installation of automatic train control devices and devices for the automatic control of automobiles at grade crossings. The board proposed in the first bill would be known as the "People's Scientific Board" and penalties are proposed for "individuals or organizations failing to carry out the suggestions of the board."

Dr. Wooding told the committee that the Interstate Commerce Commission had demonstrated itself to be "incompetent, inefficient and impractical," in its administration of laws pertaining to safety devices, particularly as to automatic train control, and that what is needed is an independent board to give inventors some chance of getting their devices adopted. He demonstrated to the committee an automatic magnetic device to give a whistle signal in the engineer's cab in case of failure to observe a block signal set against him and also to cut off the ignition and sound a gong in an automobile approaching a railroad crossing when a train is approaching. He said it was almost impossible for an independent in-

(Continued on page 262)

Operating Statistics of Large Steam Railways—Selected Items for November, 1928, Comp

Region, road and year	Average miles of road operated	Train-miles	Locomotive-miles		Car-miles		Ton-miles (thousands)		Average number of locomotives on line				
			Principal and helper	Light	Loaded (thousands)	Per cent loaded	Gross, Excluding locomotives and tenders	Net, Revenue and non-revenue	Serv-ice-able	Un-serv-ice-able	Per cent un-serv-ice-able	Stored	
New England Region:													
Boston & Albany.....	1928	407	199,112	211,543	21,504	5,136	66.9	269,747	102,247	102	22	17.4	31
	1927	407	218,603	232,287	24,829	5,208	66.7	276,467	106,930	102	16	13.6	5
Boston & Maine.....	1928	2,074	434,395	519,262	63,181	13,647	68.6	722,295	287,640	281	39	12.2	46
	1927	2,075	476,686	559,668	59,587	12,422	69.6	653,701	259,037	254	60	19.0	11
N. Y., New H. & Hart.....	1928	2,106	537,413	605,247	38,670	16,861	67.5	909,956	379,704	304	59	16.2	38
	1927	2,140	589,626	643,529	42,939	17,062	67.5	901,009	365,864	335	48	12.5	48
Great Lakes Region:													
Delaware & Hudson.....	1928	875	354,176	475,109	47,665	11,309	63.3	716,550	348,135	232	40	14.7	62
	1927	875	354,863	480,609	54,315	10,217	64.9	643,056	315,605	245	32	11.5	66
Del., Lack. & Western....	1928	998	567,343	641,995	74,486	18,849	67.9	1,079,681	465,170	235	58	19.8	9
	1927	999	548,049	625,281	73,119	17,677	66.4	1,025,609	438,948	243	49	16.8	7
Erie (inc. Chi. & Erie)....	1928	2,317	970,149	1,051,700	90,828	41,192	61.7	2,550,061	1,045,595	410	115	21.9	11
	1927	2,317	936,385	1,018,011	74,629	35,910	61.9	2,204,779	900,175	424	129	23.3	16
Lehigh Valley	1928	1,343	616,516	681,545	75,889	19,210	62.4	1,177,775	508,570	323	86	21.0	19
	1927	1,345	584,615	638,898	80,331	17,835	62.5	1,085,441	463,606	353	87	19.8	37
Michigan Central	1928	1,822	562,842	583,006	21,036	19,082	61.2	1,089,038	397,568	197	49	19.9	30
	1927	1,820	522,722	532,380	19,235	16,070	59.5	910,436	319,154	221	67	23.1	63
New York Central.....	1928	6,459	2,110,210	2,387,998	168,338	80,287	59.7	5,008,016	2,109,826	970	379	28.1	147
	1927	6,478	1,903,489	2,122,464	161,898	69,941	60.4	4,293,040	1,773,319	1,053	318	23.2	263
New York, Chi. & St. L.	1928	1,665	628,763	634,937	6,217	21,014	63.4	1,183,029	448,924	223	63	22.0	51
	1927	1,665	585,191	591,857	7,274	18,978	63.0	1,057,250	388,857	234	55	19.1	65
Pere Marquette	1928	2,181	458,162	462,849	5,351	11,599	61.5	696,133	292,964	180	28	13.6	8
	1927	2,180	424,387	429,488	5,756	10,548	61.1	639,673	270,317	183	42	18.7	11
Pitta. & Lake Erie.....	1928	231	136,527	138,932	1,559	4,796	57.4	409,551	229,097	59	10	14.2	14
	1927	231	109,077	109,871	2,204	3,772	58.4	302,633	167,429	58	18	23.1	18
Wabash	1928	2,497	773,747	801,202	11,894	23,077	63.7	1,324,622	505,122	291	75	20.5	28
	1927	2,497	675,561	706,601	12,453	19,993	62.5	1,145,241	423,086	314	56	15.2	71
Central Eastern Region:													
Baltimore & Ohio.....	1928	5,534	2,057,567	2,456,162	187,390	61,411	60.2	4,191,666	1,974,120	995	237	19.2	80
	1927	5,540	1,889,243	2,232,580	184,217	53,510	59.4	3,617,827	1,669,868	1,023	248	19.5	196
Central of New Jersey....	1928	691	277,464	298,874	45,772	8,060	57.7	555,076	261,819	184	25	12.0	19
	1927	691	263,130	284,909	45,108	7,343	57.3	493,880	233,352	184	31	14.3	23
Chicago & Eastern Ill....	1928	945	267,424	268,900	3,257	7,265	62.6	463,356	212,053	103	66	38.9	21
	1927	945	267,635	269,055	3,489	6,733	58.5	443,684	198,330	104	49	31.8	24
Clev., Cin., Chi., & St. L.	1928	2,370	740,354	768,833	18,365	23,362	60.2	1,534,535	703,414	323	113	25.9	18
	1927	2,374	689,396	719,532	18,202	21,075	60.7	1,378,850	632,446	330	92	21.7	34
Elgin, Joliet & Eastern....	1928	461	133,587	141,237	7,227	3,741	61.7	291,334	146,020	79	13	14.5	...
	1927	461	122,080	128,800	6,001	3,291	60.7	254,455	131,255	80	11	12.1	...
Long Island	1928	396	53,769	54,089	11,607	688	56.6	45,845	17,667	49	7	12.1	...
	1927	396	47,858	53,009	15,263	628	55.8	41,438	15,966	51	12	19.7	...
Pennsylvania System	1928	10,749	4,221,634	4,834,396	460,798	143,942	62.0	9,780,107	4,554,549	2,759	348	11.2	583
	1927	10,844	4,130,021	4,567,238	374,539	125,674	61.4	8,354,201	3,748,338	3,898	375	11.4	772
Reading	1928	1,144	633,014	695,874	47,327	17,730	59.8	1,258,758	632,522	311	81	20.7	21
	1927	1,131	602,579	655,340	62,780	15,954	58.6	1,142,144	566,695	315	82	20.7	39
Pocahontas Region:													
Chesapeake & Ohio.....	1928	2,729	1,151,207	1,240,511	48,578	39,524	55.5	3,230,072	1,733,251	530	93	15.0	38
	1927	2,706	1,092,741	1,179,635	44,618	34,875	55.4	2,842,597	1,510,403	543	99	15.5	60
Norfolk & Western.....	1928	2,231	882,458	1,035,401	40,503	32,909	57.5	2,797,074	1,486,744	501	58	10.4	116
	1927	2,231	764,082	929,475	33,331	26,275	58.7	2,127,771	1,120,471	544	47	7.9	138
Southern Region:													
Atlantic Coast Line.....	1928	5,127	675,571	678,781	8,051	7,452	58.2	991,688	354,214	446	51	10.3	90
	1927	5,100	747,865	751,741	14,288	18,505	58.7	1,074,401	404,083	422	57	11.9	99
Central of Georgia.....	1928	1,898	272,321	273,927	3,871	6,927	73.0	358,298	150,484	137	21	13.5	12
	1927	1,898	261,008	262,264	5,935	6,571	68.8	354,804	146,475	138	22	13.7	8
Ill. Cent. (inc. Y. & M. V.)	1928	6,713	1,953,391	1,962,677	28,862	52,919	60.6	3,521,348	1,494,943	744	107	12.6	19
	1927	6,594	1,882,216	1,899,347	31,108	49,223	57.7	3,329,952	1,362,754	770	109	12.4	18
Louisville & Nashville....	1928	5,061	1,564,994	1,636,906	54,938	34,046	58.5	2,366,119	1,135,810	597	101	14.4	42
	1927	5,048	1,593,943	1,655,362	53,150	32,515	58.3	2,255,814	1,068,292	620	106	14.6	35
Seaboard Air Line.....	1928	4,481	588,348	603,671	9,774	15,097	62.2	879,049	331,807	249	60	19.5	16
	1927	4,282	545,531	560,200	11,118	14,045	63.0	806,443	313,672	226	63	21.9	25
Southern	1928	6,679	1,506,527	1,537,091	31,595	37,210	62.6	2,127,561	846,695	849	116	12.0	121
	1927	6,718	1,423,801	1,449,110	28,930	35,583	62.9	1,995,231	775,443	827	124	13.0	68
Northwestern Region:													
Chi. & North Western....	1928	8,463	1,390,638	1,450,826	24,115	34,691	61.4	2,125,120	815,249	760	121	13.8	109
	1927	8,478	1,411,247	1,466,788	24,979	34,090	60.3	2,085,404	784,060	808	126	13.5	136
Chi., Milw., St. P. & Pac.	1928	11,248	1,640,884	1,756,337	98,450	48,192	63.4	2,866,781	1,206,870	767	171	18.2	142
	1927	11,204	1,643,599	1,740,047	103,081	47,004	62.9	2,799,968	1,182,934	828	138	14.3	145
Chi., St. P., Minn. & Om.	1928	1,724	316,284	336,982	15,217	6,723	64.4	388,839	163,317	155	31	16.8	23
	1927	1,724	312,663	336,569	15,717	6,603	63.6	373,287	148,828	164	28	14.4	38
Great Northern	1928	8,303	1,056,291	1,089,087	72,879	38,524	66.5	2,386,909	1,111,009	515	116	18.4	87
	1927	8,163	951,938	983,873	59,857	33,119	67.7	1,973,310	901,231	581	89	13.3	21
Minn., St. P. & S. St. M.	1928	4,358	511,131	534,728	8,076	14,654	67.4	807,289	361,762	207	41	16.5	21
	1927	4,368	557,370	572,187	5,841	13,694	66.2	744,481	324,527	222	25	10.2	13
Northern Pacific	1928	6,477	838,588	890,616	55,567	28,681	68.1	1,645,412	722,019	452	114	20.1	42
	1927	6,476	858,475	916,348	52,121	28,027	69.5	1,577,285	711,145	478	140	22.7	56
Oreg.-Wash. R. R. & Nav.	1928	2,246	209,791	220,280	15,567	6,227	70.8	360,366	159,159	133	11	7.9	3
	1927	2,154	211,537	222,235	15,395	6,150	69.4	363,872	165,106	138	14	9.1	3
Central Western Region:													
Atch., Top. & S. Fe (incl. P. & S. F.).....	1928	10,455	1,791,576	1,976,574									

pared with November, 1927, for Roads with Annual Operating Revenues Above \$25,000,000.

Region, road and year	Average number of freight cars on line			Per cent un-serv-ice-able	Gross ton-miles per train-hour, ex-cluding locomotives and tenders	Gross tons per train, ex-cluding locomotives and tenders	Net tons per train	Net tons per loaded car	Net ton-miles per car-day	Car miles per car-day	Net ton-miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles, including locomotives and tenders	Locomotive miles per loco-motive-day	
	Home	Foreign	Total											
New England Region:														
Boston & Albany.....	1928	2,442	5,460	7,902	3.7	18,809	1,355	514	19.9	431	32.4	8,373	168	62.7
	1927	2,930	5,747	8,677	2.9	15,290	1,265	489	20.5	411	30.0	8,757	165	72.8
Boston & Maine.....	1928	9,497	12,999	22,496	3.0	20,894	1,663	662	21.1	426	29.5	4,624	112	60.7
	1927	12,723	15,306	28,029	6.7	13,495	1,371	543	20.9	308	21.2	4,161	134	65.8
N. Y., New H. & Hart.	1928	14,949	19,529	34,478	9.2	21,455	1,693	707	22.5	367	24.1	6,011	113	59.2
	1927	18,588	20,532	39,120	11.1	18,633	1,528	621	21.4	312	21.5	5,699	125	59.7
Great Lakes Region:														
Delaware & Hudson.....	1928	8,446	6,686	15,132	3.0	25,332	2,023	983	30.8	767	39.3	13,262	139	64.0
	1927	8,250	6,456	14,706	4.0	21,367	1,812	889	30.9	715	35.7	12,023	152	64.4
Del., Lack. & Western....	1928	15,358	9,638	24,996	3.2	23,662	1,903	820	24.7	620	37.0	15,534	139	81.4
	1927	16,533	8,378	24,911	4.5	22,555	1,871	801	24.8	587	35.6	14,642	140	79.8
Erie (inc. Chi. & Erie)....	1928	28,260	23,964	52,224	4.0	33,234	2,629	1,078	25.4	667	42.6	15,044	120	72.5
	1927	31,921	21,112	53,033	4.2	28,730	2,355	961	25.1	566	36.5	12,949	131	65.9
Lehigh Valley	1928	21,171	12,254	33,425	9.4	25,870	1,910	825	26.5	507	30.7	12,619	154	61.6
	1927	22,112	10,404	32,516	10.3	25,909	1,857	793	26.0	475	29.2	11,486	151	54.4
Michigan Central	1928	18,120	16,757	34,877	5.6	30,290	1,935	706	20.8	380	29.8	7,273	112	81.8
	1927	19,745	12,960	32,705	4.1	26,783	1,742	611	19.9	325	27.5	5,847	121	63.9
New York Central.....	1928	63,262	73,762	137,024	5.9	31,141	2,373	1,000	26.3	513	32.7	10,888	111	63.2
	1927	69,694	67,092	136,786	4.6	28,443	2,255	932	25.4	432	28.2	9,125	116	55.5
New York, Chi. & St. L.	1928	12,734	11,005	23,739	6.3	26,023	1,882	741	21.4	630	46.5	8,989	113	74.9
	1927	13,962	10,319	24,281	5.8	24,946	1,807	664	20.5	534	41.4	7,786	110	69.2
Pere Marquette	1928	9,506	9,849	19,355	3.8	19,527	1,519	639	25.3	505	32.5	4,478	111	74.9
	1927	9,862	8,521	18,383	3.9	18,968	1,507	637	25.6	490	31.3	4,133	109	64.4
Pitts. & Lake Erie.....	1928	10,782	10,625	21,407	9.2	32,801	3,000	1,678	47.8	357	13.0	33,020	110	68.7
	1927	13,518	6,642	20,160	6.0	31,534	2,774	1,535	44.4	277	10.7	24,112	99	49.2
Wabash	1928	14,393	13,231	27,624	3.0	27,693	1,712	653	21.9	610	43.7	6,743	127	74.0
	1927	16,488	11,187	27,675	2.5	27,154	1,695	626	21.2	510	38.6	5,648	127	64.7
Central Eastern Region:														
Baltimore & Ohio.....	1928	68,844	35,459	104,303	5.2	22,854	2,037	959	32.1	631	32.6	11,890	152	71.5
	1927	74,856	31,757	106,613	5.6	21,124	1,915	884	31.2	522	28.2	10,048	160	63.4
Central of New Jersey....	1928	16,416	12,613	29,029	5.7	21,406	2,001	944	32.5	301	16.0	12,630	157	55.0
	1927	18,197	10,971	29,168	6.3	19,449	1,877	887	31.8	267	14.6	11,259	158	51.2
Chicago & Eastern Ill....	1928	12,455	4,274	16,729	38.3	25,614	1,733	793	29.2	423	23.1	7,479	131	53.9
	1927	13,148	4,124	17,272	31.1	22,315	1,658	741	29.5	383	22.2	6,995	139	59.6
Clev., Cin., Chi. & St. L.	1928	17,980	21,313	39,293	5.2	28,076	2,073	950	30.1	597	32.9	9,892	121	60.3
	1927	21,597	20,854	42,451	4.2	26,177	2,000	917	30.0	497	27.3	8,881	128	58.4
Elgin, Joliet & Eastern...	1928	8,646	7,412	16,058	4.7	16,063	2,181	1,093	39.0	303	12.6	10,569	127	53.8
	1927	9,107	6,682	15,789	5.7	15,005	2,084	1,075	39.9	277	11.5	9,491	137	49.4
Long Island	1928	1,486	5,503	6,989	1.6	5,819	853	329	25.7	84	5.8	1,481	343	39.1
	1927	1,695	5,899	7,594	1.3	4,728	866	334	25.4	70	4.9	1,345	334	36.2
Pennsylvania System	1928	202,241	87,891	290,132	6.1	26,697	2,317	1,079	31.6	523	26.7	14,124	129	55.8
	1927	212,641	80,250	292,891	6.4	23,480	2,023	908	29.8	427	23.3	11,522	130	50.3
Reading	1928	23,035	16,020	39,055	4.7	21,544	1,989	999	35.7	540	25.3	18,438	143	63.1
	1927	27,209	12,858	40,067	2.5	21,097	1,895	940	35.5	471	22.7	16,696	156	60.2
Peachontas Region:														
Chesapeake & Ohio.....	1928	29,269	12,154	41,423	2.5	34,876	2,806	1,506	43.9	1,395	57.3	21,169	93	68.9
	1927	33,063	11,380	44,443	3.0	30,871	2,601	1,382	43.3	1,133	47.2	18,608	100	63.6
Norfolk & Western.....	1928	28,777	9,882	38,659	0.9	42,390	3,170	1,685	45.2	1,282	49.3	22,209	132	64.1
	1927	31,764	8,313	40,077	1.1	37,583	2,785	1,466	42.6	932	37.2	16,737	145	54.3
Southern Region:														
Atlantic Coast Line.....	1928	21,602	9,427	31,029	6.7	20,247	1,468	524	20.3	381	32.2	2,303	108	46.1
	1927	23,441	9,831	33,272	5.6	19,083	1,437	540	21.8	405	31.6	2,641	111	53.2
Central of Georgia.....	1928	4,274	5,081	9,355	5.2	18,885	1,316	553	21.7	536	33.8	2,643	139	58.6
	1927	4,312	4,902	9,214	4.5	18,885	1,359	561	22.3	530	34.6	2,573	139	55.9
Ill. Cent. (inc. Y. & M.V.)	1928	39,345	24,201	63,546	3.9	24,253	1,803	765	28.2	784	45.8	7,423	134	78.0
	1927	41,477	24,380	65,857	6.5	23,785	1,769	724	27.7	690	43.2	6,889	137	73.7
Louisville & Nashville...	1928	42,950	17,071	60,021	9.8	18,959	1,512	726	33.4	631	32.3	7,480	154	80.8
	1927	44,773	17,128	61,901	10.0	17,159	1,415	670	32.9	575	30.0	7,054	159	78.5
Seaboard Air Line.....	1928	15,419	9,442	24,861	7.6	19,185	1,494	564	22.0	445	32.6	2,468	136	66.1
	1927	15,422	9,121	24,543	7.3	18,129	1,478	575	22.3	426	30.3	2,442	142	65.9
Southern	1928	46,965	20,730	67,695	9.3	18,936	1,412	562	22.8	417	29.3	4,226	159	54.2
	1927	45,156	20,723	65,879	5.8	18,413	1,401	545	21.8	392	28.6	3,847	162	51.8
Northwestern Region:														
Chi. & North Western...	1928	45,222	29,776	74,998	6.5	20,618	1,528	586	23.5	362	25.1	3,211	134	55.8
	1927	46,525	29,553	76,078	6.2	18,935	1,478	556	23.0	344	24.8	3,083	132	53.2
Chi., Mil., St. P. & Pac.	1928	49,649	24,317	73,966	3.0	22,763	1,747	735	25.0	544	34.2	3,577	134	65.9
	1927	52,889	24,771	77,660	5.3	21,762	1,704	720	25.2	508	32.1	3,519	139	63.6
Chi., St. P., Minn. & Om.	1928	2,794	9,537	12,331	6.3	16,390	1,229	516	24.3	441	28.2	3,159	126	63.0
	1927	2,619	9,336	11,955	9.2	15,169	1,194	476	22.5	415	29.0	2,878	128	61.1
Great Northern	1928	40,436	18,147	58,583	3.7	26,612	2,260	1,052	28.8	632	33.0	4,460	133	61.4
	1927	41,646	15,370	57,016	3.8	23,598	2,073	947	27.2	527	28.6	3,680	138	51.9
Minn., St. P. & S. St. M.	1928	19,462	6,728	26,190	3.2	18,872	1,579	708	24.7	462	27.8	2,767	109	73.0
	1927	20,532	6,536	27,068	3.6	16,399	1,336	582	23.7	400	25.5	2,477	115	78.0
Northern Pacific	1928	35,662	11,528	47,190	5.9	24,927	1,962	861	25.2	510	29.7	3,716	152	55.7
	1927	35,480	10,609	46,089	6.3	22,843	1,837	828	25.4	514	29.1	3,660	158	52.2
Ore.-Wash. R.R. & Nav.	1928	7,511	4,520	12,031	4.6	22,465	1,718	759	25.6	441	24.4	2,363	173	54.4
	1927	7,913	4,194	12,107	5.7	21,109	1,720	781	26.8	455	24.4	2,555	175	52.0
Central Western Region:														
Atch., Top. & S. Fe (incl. P. & S. F.).....	1928	52,344	19,701											

News of the Week

(Continued from page 259)

ventor to obtain favorable consideration of a new appliance because of the "monopolistic control" of the railroads and companies that manufacture devices used by the roads.

W. N. Doak, national legislative representative of the Brotherhood of Railroad Trainmen, appeared in opposition to the bills, saying the railroad labor organizations wish the present safety appliance laws let alone, and Alfred P. Thom, Jr. for the American Railway Association, said that if the committee proposes to give further consideration to the bills the railroads would desire an opportunity to be heard at the proper time. No arrangement was made, however, for further hearings.

Rocky Mountain Safety Meeting Held at Denver

A trip to the locomotive repair shops of the Chicago, Burlington & Quincy at Denver, for the purpose of observing safety practices in use featured the program of the Steam Railroad Section of the first annual Rocky Mountain Regional Safety Conference, held at Denver, Colo. on January 10 and 11, under the auspices of the Denver Safety Council in co-operation with the National Safety Council. About 60 railroad representatives were conducted through the shops by J. B. Irwin, superintendent. The plant surgeon gave a first aid exhibition with one of the shop first-aid teams.

At the afternoon session of the first day, D. G. Phillips, superintendent of safety of the Wabash, and chairman of the Safety Section A. R. A., told how the railroads, as a whole, had already passed the 1930 goal—a 35 per cent reduction in seven years. He said that either the goal was not set high enough or the period was not made short enough.

A message from J. S. Pyeatt, president of the Denver & Rio Grande Western, was brought to the meeting by A. C. Shields, general manager of this road, who briefly recounted the steps in

railroad safety. He was proud of the fact his road had no accidents in 1928 of sufficient importance to have been investigated by the Interstate Commerce Commission.

George H. Warfel, assistant to the general manager of the Union Pacific, described the most up-to-date practices for obtaining greater safety. His main points were, good tools, constant and thorough training and supervision, and rigid discipline. He paid tribute to the men in the roadway department who so faithfully perform their duties under the most trying and difficult conditions. He had one of the Union Pacific roadmasters with his foremen stand up as he read their splendid record made by an average force of 840 men who have accumulated 3,300,000 man-hours without a single reportable injury since July 11, 1927, 19 months.

The Savannah Bill-of-Lading Fraud

The decision of the Supreme Court of the United States on January 2, in a suit against the Seaboard Air Line, wherein that road was required to pay \$10,000 for the act of a dishonest freight office employee, was reported in the *Railway Age* of January 12, page 168. The absence of explanation of certain points concerning the acts of the agent has led to unusual interest in this decision, and, from a correspondent who has made himself acquainted with the details of the case, the *Railway Age* has the following supplementary information:

The Seaboard Air Line has terminals at Charleston, S. C. and Savannah, Ga. The employee was at its Savannah office. He gave the cotton factor notice of arrival of the shipment under a designated order-notify bill of lading. Later, on the same day, a local bank presented to the factor the described bill of lading, regular in form and properly endorsed, with an attached draft on the factor for \$10,000, which he paid, in reliance on the notice of arrival and the apparent regularity of the documents.

After presentation of the draft and before payment, the railroad's employee (McDonnell) again informed the factor,

in response to an inquiry, that the cotton described in the bill of lading had arrived. There was evidence also plainly indicating that the factor would not have paid the draft without that assurance. "The draft and the bill of lading, purporting to be issued by respondent (the railroad company) at its Charleston office, eventually proved to have been forged and negotiated by McDonnell in Charleston while temporarily absent from his duties in Savannah, and his entire course of conduct with respect to them, including his false notice to the factor, was in the successful pursuance of a scheme to defraud petitioner of the amount paid on the draft."

These are the facts as detailed in the Supreme Court's opinion. The lower court's opinion contains the following additional details. McDonnell obtained leave of absence and went to Charleston, where he presented himself under the name of J. A. Tillman, at the Bank of Charleston and drew on the factor in the name of Tillman for \$10,000, with a bill of lading attached purporting to cover 110 bales of cotton marked J. A. T. received, of that date, at Charleston, to be carried to Savannah, order of said Tillman, notify the factor. McDonnell thus forged the bill of lading, the endorsement thereon and the draft. *Tillman was a fictitious name; and no such shipment existed.* McDonnell returned next day to Savannah. The forged draft and bill of lading were forwarded there for collection with a letter to the effect that "Tillman" came to the Bank of Charleston unidentified. This letter, with the draft and bill of lading attached, the local bank presented to the factor, who telephoned McDonnell at his office. McDonnell stated that the cars designated in the forged bill of lading had arrived at Savannah. Thereupon, the factor paid the draft. "McDonnell's duties as an employee of the railway company in the Savannah office included giving notice to the trade of the arrival of cotton," says the court.

After telephoning that the cotton had arrived, McDonnell obtained another leave of absence, went to Charleston, secured the \$10,000 from the bank, at which he had placed the draft for collection, and absconded. He has not been apprehended.

* * * *



The Southern's "Big Parade" at Cincinnati

The four passenger trains that leave Cincinnati for the south over the Southern Railway every evening between 7:45 and 10:40. These trains are: No. 27, the Carolina Special, 7:45; No. 43, the New Orleans Special, 8:05; No. 1, the Ponce De Leon, 8:40; No. 5, the Suwanee River Special, 10:40.

Traffic

The Union Pacific has opened a ticket office at 1403 Fourth avenue, Seattle, Wash.

The annual meeting of the Northwest Shippers' Advisory Board will be held at Minneapolis, Minn., on January 29. Ralph Budd, president of the Great Northern and A. C. Loring, president of the Pillsbury Flour Mills Company will be the principal speakers.

Twenty one carloads of pickles in a single train passed recently through Atlanta, Ga., on the way from Montgomery, Ala., to northern cities. These pickles, made from cucumbers grown in south-eastern Alabama, moved over the Atlanta & West Point to Atlanta and thence northward over the Southern.

The Illinois Central has shortened the running time of its fast freight train, the Panama Dispatch, between East St. Louis, Ill., and New Orleans, La., seven hours and 20 minutes, the new schedule being 34 hr. 10 min. instead of 41 hr. 30 min. The train now leaves East St. Louis at 7 p. m. as formerly and arrives at New Orleans at 5:10 a. m. the second morning instead of 12:30 p. m.

The St. Louis-San Francisco, in conjunction with the Missouri-Kansas-Texas has shortened the schedule of its Bluebonnet and its Texas Special between St. Louis, Mo., and San Antonio, Tex., 35 min. and 45 min. respectively. The Texas Special, under the new schedule, makes direct connection with the Sunbeam of the Southern Pacific which now leaves Dallas at 12:35 p. m. instead of 12:01.

During the calendar year ended December 31, 1928, a total of 6,334 commercial vessels, paying tolls aggregating \$26,375,962, went through the Panama Canal. The daily average number of transits for the year was 17.31, and the daily average tolls collection \$72,065. In the number of commercial transits and the tolls collected, the year was second only to the fiscal year ended June 30, 1928, when 6,456 vessels transited, paying tolls of \$26,944,499.

A special committee of the fresh fruit and vegetable industry and a special committee of the Freight Claim division of the American Railway Association held a joint conference at the Hotel Stevens, Chicago, on January 18 to discuss conditions and circumstances affecting claims. The docket included: in-transit and terminal inspections of fresh fruits and vegetables; delays caused by meeting trains or heavy movement of traffic; icing, etc.; claims for one day loss of market; 50 per cent icing as a factor in claim settlements; and claims for delay and market decline.

The St. Louis-San Francisco has established two fast freight trains between Ft. Worth, Tex., and St. Louis, Mo.,

and Kansas City, which shorten the existing schedules 20 hours. Train No. 32 leaves Ft. Worth at 12:05 a. m. and arrives in St. Louis at 3 a. m. the third day (50 hr. 55 min.) and Kansas City at 4 p. m. the second day (39 hr. 55 min.). Cars for this train leave Oklahoma City, Okla., at 7:30 p. m. and Avard at 2:45 p. m. Train No. 34 leaves Ft. Worth at 6:30 a. m. and arrives in St. Louis at 8 a. m. the third morning (49 hr. 30 min.) and Kansas City at 12:30 a. m. the second morning, 42 hours.

Correction

The division passenger agent and the women's tour department of the Baltimore & Ohio at Chicago are located in the Bankers' building, 105 West Adam street, while the general passenger agent and the assistant general passenger agent are in the Grand Central station, instead of as shown in the *Railway Age* of January 12, page 170.

Frisco Counts 365 New Industries in 1928

A total of 365 new industries, representing an investment in plants and facilities of \$11,610,000, were established along the St. Louis-San Francisco during 1928, according to the annual report of J. B. Hilton, industrial commissioner of that railroad. These new plants necessitated the construction of 96 spur tracks and 17 extensions to existing tracks, involving an expenditure of \$345,000.

Porto Rico Up to Date

The American Railroad Company of Porto Rico is introducing itself to the people of "the states" by circulating a timetable, printed in a pamphlet of 30 pages, accompanied by numerous full-page photographic illustrations showing public buildings, scenery along the line, typical trains and notable bridges. Most of the text in the pamphlet is given in both Spanish and English. Of the 418 kilometers of railroad in Porto Rico, the American Railroad operates about 300 kilometers. Its main line, 277 meters (171 miles) in length, extends from San Juan on the north coast, westward 143 kilometers to Aguadilla, thence southward and eastward to Ponce on the south coast. Its gage is one meter, (39.37 inches). There is one through train each way in the day time and one in the night; and, in addition, there are a number of local trains, some of them consisting of steam motor passenger cars. The general manager of the road is Emilio S. Jimenez and the traffic manager is Jose Tormos.

California Fruits in New York

Shipments of oranges and grapefruit out of California during the past year have amounted to 46,922 cars; and of lemons 12,474 cars; or a total of about 26 million boxes of these fruits; and the *Erie Railroad Magazine* says that of the 7,895 cars of oranges and lemons coming to New York from California, 7,538, or

95½ per cent, came over the Erie. The Erie brought to New York the first car of California oranges in 1898. At the present time, the Duane street pier station of the Erie, in New York, unloads, on some days, as many as 400 cars, requiring the employment of 500 stevedores. The California Fruit Growers' Exchange which manages the advertising for the producers, reports that the cost of both marketing and advertising, in the past season has been but 2.3 per cent of the delivered value of the goods. This exchange promotes the retail sale of orange juice as a drink by introducing an electrical juice extractor, of which 47,614 are in operation in the United States.

Pennsylvania Ferry Jersey City to Brooklyn

The Pennsylvania has established a ferry for vehicular traffic between Atlantic avenue, Brooklyn, N. Y., and Exchange place, Jersey City, N. J. The ferry boats Pittsburgh and New Brunswick are assigned to the route and will provide half hourly service each way. The running time is 20 minutes. This ferry, which will enable large numbers of automobiles and trucks to avoid passing through the streets of Manhattan, is a restoration of the boat line which was discontinued in 1910, when the Pennsylvania began running its through trains to and from the new station in Manhattan, and discontinued most of the trains to and from Exchange place. The ferry charge for a pleasure automobile, regardless of its length or number of occupants, will be 75 cents; minimum charge for trucks, 75 cents; and for a horse and vehicle, including driver and helper, 75 cents.

The railroad company celebrated the opening by giving a luncheon at Jersey City to a large number of guests. It was said that this ferry will take 1200 trucks off the East River bridges daily.

Great Lakes Advisory Board

The Great Lakes Regional Advisory Board held its twenty-third regular meeting at Detroit, Mich., on January 17, with an attendance of 700 business men and railroad officers. A summary of the reports presented by commodity committees shows that an increase of 9.4 per cent is expected in the volume of freight, in the territory of this board, during the current quarter, as compared with the first quarter of 1928. The report of the banking committee contains a general survey of the business situation and anticipates increased production in important industries. Export trade has been steadily growing and this growth is expected to continue. Shipments of automobiles are expected to fill 167,234 freight cars, or about 30,000 cars more than were required in three months a year ago.

At the luncheon following the morning session of the meeting, Wm. B. Stout, consulting engineer for the airplane division of the Ford Motor Company spoke on the coordination of air and rail transport. S. T. Stackpole,

traffic manager of the Pennsylvania, at Chicago, reviewed the great improvement that has been made in efficiency of freight movement by the railroads in the past few years.

I. C. C. Bill Tabled by House Committee

The House committee on interstate and foreign commerce held a hearing on January 22 on H. R. 15,971, introduced by Representative James S. Parker, chairman of the committee, in accordance with a recommendation made by the Interstate Commerce Commission in its annual report, to amend Section 10 of the interstate commerce act to provide for a minimum fine of \$500 for such violations of the act as false billing of shipments, filing false loss and damage claims and other practices which result in obtaining transportation at less than lawful rates.

Commissioner Frank Mc Manamy and Thomas P. Healy, director of the commission's Bureau of Inquiry, appeared in support of the bill, but at a brief executive session following the hearing the committee voted to lay it on the table. "Section 10 contains four paragraphs," Commissioner Mc Manamy said, and it was proposed to provide a minimum fine of \$500 for each offense named in those paragraphs. At present no minimum fine is named. A maximum fine of \$5,000 is provided for the offenses named in each of the four paragraphs, and, where the defendant is an individual, a maximum penitentiary sentence of two years is prescribed also. However, the courts have not been inclined to pronounce sentences of imprisonment in cases arising under this section, only three defendants having thus been sentenced since January 1, 1920. Therefore, he said it is important that a substantial minimum fine be provided if the section is to accomplish the primary purposes for which it was enacted, namely, to preserve the integrity of rates published by the carriers and filed by them with the commission, and to protect the honest shipper from the unfair competition which is bound to flow from the acts of his dishonest competitors.

Members of the committee asked if one of the reasons why no minimum fine was provided for in the original

law was not to afford the judges some discretion because of the somewhat general language of the prohibitions in the law, Mr. Mc Manamy said he had not so understood it, but that the commission used discretion in its administration of the law.

Special Saddles Built to Ship Big Cylinder Over Southern

What is said to be the longest piece of machinery ever to be shipped in the United States as well as the longest to be built and shipped in the South as a single unit, recently was carried over the lines of the Southern from Chattanooga, Tenn., to Jackson, Miss., a distance of approximately 300 miles.

The shipment consisted of a steel cylinder, 137 ft. in length, which was built by the Hedges-Walsh-Weidner Boiler Company, of Chattanooga, for the Gulf-States Creosoting Company at Jackson.

From blueprints submitted by the builders, G. A. Harris, general foreman of the Chattanooga car department of the railway, and J. F. Burke, chief car inspector, developed a plan of loading which permitted the movement of the shipment over the Southern's lines to Meridian, Miss., where it was delivered to the Illinois Central for the remaining 100 miles of its journey.

First a study was made of every curve along the route which the shipment was to take. It was found that the weight could be distributed on two flat cars with 90 feet between the bearings carrying the load. For this purpose two flat cars of 190,000 lb. capacity were secured with a 46-ft. flat car as a spacer in between. Two additional flat cars were used to take care of the projecting portions, but carried none of the weight. Slack was taken out of the couplers connecting the three center cars and blocks were inserted to hold them fast.

Special saddles of one-inch boiler steel were designed and built in the plant of the Hedges-Walsh-Weidner Company. They measured nine ft. in length and 30 in. in width. Each weighed 4,000 lb., and was held in place on the car by a three-foot steel pin inserted in the center which worked in a six-inch slot to allow for slack between cars and to allow free movement when

rounding curves. A decking of oak boards covered by one-inch boiler steel was first laid and on this the bolsters were permitted free action at each end. The saddles were lined with one-inch oak boards to serve as a cushion for the cylinder which was made additionally secure by passing three "U" rods over the top and rods from each end to the saddle.

The entire weight of the shipment was 263,000 lb., bringing a total revenue of \$1,472.31. Two such cylinders were built and shipped over the Southern by the same company. The accompanying illustration was furnished through the courtesy of the Southern.

"Fancy Reading" Concerning Errors in Way-Billing

A freight claim officer of a prominent road, well known for his frank and friendly attitude toward agents, conductors and others, and who issues special pink circulars now and then to stimulate enthusiasm in their efforts to "handle the company's business as you would your own" recently gave them the following little lecture on "passing the buck":

"From time to time we notice with regret a disposition on the part of some of our employees to allow an irregularity in the way of billing, carding, seal records, refrigeration, etc., to go uncorrected, on the ground that the mistake was made by some other employee or some other department and that, therefore, they are not individually interested in preventing delay, loss, damage or confusion. A conscientious and loyal employee will at once take some action to protect the company's interests by straightening out the error of someone else or reporting it to someone higher in authority who has the power to rectify the condition in order to save the railroad from an unnecessary loss. There should be some one in authority at every station to whom such cases could be referred with power to adopt remedial measures. This business of "passing the buck" or making long explanations results in very fancy reading but is no protection to the railroad. It is well to remember that placing responsibility on someone else neither shortens the delay nor mitigates damages for which the carrier has to pay. The question is, *who could have pulled it out of the fire and did not do so?*"



The Large Cylinder Recently Shipped Over the Southern Showing Special Saddles and Arrangement of Cars

Equipment and Supplies

Locomotives

THE WEIRTON STEEL COMPANY is inquiring for one locomotive of the 0-4-0 type.

THE CANADIAN PACIFIC has ordered 20 locomotives of the 2-10-4 type from the American Locomotive Company through its Montreal Locomotive Works, Ltd. These locomotives will have 25½ in. by 32 in. cylinders with a cut-off of 85 per cent; a total weight in working order of 440,000 lb.; the boiler pressure will be 275 lb.; the driving wheels will have a diameter of 63 in.; oil will be used for fuel. Inquiry for this equipment was reported in the *Railway Age* of January 12.

Freight Cars

THE ILLINOIS CENTRAL is inquiring for 25 caboose cars.

THE NORFOLK & WESTERN is asking for bids for rebuilding 1,000 all steel 57½ ton hopper cars.

THE LITCHFIELD & MADISON is inquiring for 100 drop bottom and 100 solid bottom gondola cars of 50 tons' capacity.

THE GOODWIN-GALLAGHER SAND & GRAVEL CORPORATION has ordered six steel hopper cars of 30 tons' capacity, from the Magor Car Corporation.

PICKANDS, MATHER & COMPANY, Cleveland, Ohio, is inquiring for 30 air dump cars of 25 cu. yd. capacity.

THE NORTH AMERICAN CAR COMPANY has ordered 500 tank cars of 8,000 gal. capacity from the Pressed Steel Car Company.

THE WHEELING & LAKE ERIE has ordered 1,000 gondola cars of 70 tons' capacity from the Standard Steel Car Company. Inquiry for this equipment was reported in the *Railway Age* of January 12.

THE TEXAS COMPANY is inquiring for 60 tank cars of 12,000 gal. capacity without heater coil; 15 tank cars of 12,000 gal. capacity with heater coil; 550 tank cars of 10,000 gal. capacity without heater coil and 50 tank cars of 10,000 gal. capacity, with heater coil.

THE UTAH COPPER COMPANY has ordered 100 ore cars of 90 tons' capacity from the Pressed Steel Car Company and 22 air dump cars of 30-cu. yd. capacity from the Koppel Industrial Car & Equipment Company. Inquiry for this equipment was reported in the *Railway Age* of December 8.

THE CANADIAN PACIFIC has placed orders recently for new equipment including the following:

5 depressed center flat cars to be built at the railroad company's Angus shops

500 steel box cars from the Eastern Car Company
6 steel ore cars from the National Steel Car Corporation
2300 steel box cars from the National Steel Car Corporation
2200 steel box cars from the Canadian Car & Foundry Company
50 Hart ballast cars from the Canadian Car & Foundry Company

The following new equipment has been delivered: 23 caboose cars, built at the railroad company's Angus shops; 21 flat cars built by the Eastern Car Company; and three Jordan spreaders.

Passenger Cars

THE NORTHERN PACIFIC is inquiring for seven gas electric rail motor cars.

Signaling

THE PENNSYLVANIA has ordered from the Union Switch & Signal Company material for installing automatic block signals on its line between Xenia, Ohio, and New Paris, 52 miles, single track; and between Xenia and Clare, 19 miles double track and 37 miles single. The order includes 150 position-light signals, 280 copper oxide rectifiers, 800 relays, and other material.

Iron and Steel

THE ATCHISON, TOPEKA & SANTA FE has ordered 804 tons of structural steel for a car shed at Richmond, Cal., from the Judson Pacific Company.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered 1,900 tons of structural steel for bridge work at Joliet, Ill., from the American Bridge Company.

Machinery and Tools

THE NORTHWESTERN PACIFIC has ordered one 15-ton overhead traveling crane from the Judson Pacific Company.

THE ANTOFAGASTA (CHILE) & BOLIVIA, in South America, has just completed the work of converting to metre gage the whole of its two-foot, six-inch gage lines.

The project was begun late in 1926, and involved the alteration of approximately 528 miles of main line, branches and sidings. Aside from this, it also involved the conversion of most of the rolling stock of the road.

The main line was finished last July, the entire traffic over the road being suspended for six days. During that brief period 235 miles of line were changed over to the new gage.

Bolivia, the producer of tin, copper and other exports has hitherto found her only outlet for these products over the narrow gage of the Antofagasta. But now the through running of metre gage railways from the interior of Bolivia will be improved in several directions, since La Paz, the capital, is now in through rail communication with Buenos Aires.

Supply Trade

The Watson-Stillman Company, New York, has appointed the Midvale Mining & Manufacturing Company as its representative in the St. Louis district.

W. A. Peck, assistant district sales manager of the Republic Iron & Steel Company, has been promoted to district sales manager with headquarters at Cincinnati, Ohio, to succeed Martin E. McKee, resigned.

W. E. Dean, assistant chief engineer of the Westinghouse Air Brake Company, at Wilmerding, Pa., has been appointed chief engineer of the Westinghouse Air Brake Company of Australasia, Ltd., with headquarters at Sydney, New South Wales.

The Linde Air Products Company, New York, has opened a new Linde oxygen producing plant at Memphis, Tenn., and the old Memphis plant will be discontinued. E. C. Heyman, superintendent of the old plant will assume similar duties at the new plant.

The Wilcox-Rich Corporation, Detroit, Mich., and the Rich Tool Company have been consolidated and the latter company hereafter will be operated as the Rich tool division of the Wilcox-Rich Corporation.

J. E. Durstine has been appointed district sales representative for the southeast for the Lincoln Electric Company, Cleveland, Ohio, with headquarters at Birmingham, Ala. H. P. Egan, has been appointed district sales representative for central Ohio with headquarters at Columbus, Ohio.

The Heat Transfer Products, Inc., has become affiliated with the American Locomotive Company. All manufacturing will be done in the plants of the American Locomotive Company. George T. Jacocks remains as manager of Heat Transfer Products, Inc., and the company name will be retained. The office of the company is at 30 Church street, New York.

The name of the Cutler-Hammer Mfg. Company, Milwaukee, Wis., has been changed to Cutler-Hammer, Inc., The new company is organized as a Delaware corporation with no change in personnel. In the change from a Wisconsin to a Delaware corporation, the Cutler-Hammer Mfg. Company, Milwaukee, the Cream City Foundry Company, Milwaukee, and the Cutler-Hammer Manufacturing Company, New York, are united under one name.

W. N. Agnew, general traffic manager of the Worthington Pump & Machinery Corporation, has been appointed assistant to the president and general traffic manager, with headquarters at New York. Mr. Agnew has been connected with the Worthington organiza-

tion for more than 25 years. He joined the staff of the old International Steam Pump Company, as traffic manager, in



W. N. Agnew

1910, and in 1925, was made general traffic manager of the Worthington Pump & Machinery Corporation.

Andrew Wells Robertson, who has been elected chairman of the board of directors of the Westinghouse Electric & Manufacturing Company, is of Scottish parentage and is in his forty-ninth year. He was graduated from Allegheny College, Meadville, Pa., in 1906, with the degree of A. B. and from the Law School of the University of Pittsburgh in 1910 with the degree of L. L. B. After practicing law in Pittsburgh,



Andrew Wells Robertson

he became general attorney of the Philadelphia Company, which, with its affiliated corporations, operates all of the electric light and street railway properties and most of the gas properties in the Pittsburgh district. After having served for several years as vice-president of that company in charge of public relations and the law department, he was elected its president in 1926, which office he has held since. Mr. Robertson will withdraw from his other business activities and devote his entire time to the Westinghouse Company, for the present his official headquarters will be in Pittsburgh.

Construction

New York Central Submits Agreement on New York Improvement Project

Plans for the electrification of its freight lines on Manhattan Island, New York, for the elimination of all grade crossings in New York City between Spring street and the Harlem ship canal, and enlargement of its yard and terminal facilities were made known recently by the New York Central in the form of an agreement between the road and the city, submitted to the New York Board of Estimate and Apportionment by Patrick E. Crowley, president of the road.

Under the terms of the agreement which the Board of Estimate is considering, while awaiting the sanction of the Transit Commission the New York Central will abandon its present terminal at St. John's park and all of its track on the island south of Canal street. It will establish a new terminal and yard at Spring street between West and Washington streets on land to be acquired for the purpose. The new construction program, according to the agreement, also includes the enlarging of its yard at Thirtieth street, the building of new yard facilities at Sixtieth street and the building of a new yard at Dyckman street on land now under water and to be filled in for the use of the railroad. The building of several new docks and warehouses along its route on the west side also will be involved.

From the new Spring street terminal to Thirtieth street the railroad will run its tracks on an elevated structure, thus eliminating all grade crossings. At Thirtieth street the tracks will be depressed to carry them under all streets northward to One Hundred Twenty-Third street, where the tracks cross over One Hundred Twenty-Fifth street by viaduct. The agreement also will permit the building of a new four-track lift bridge over the Harlem ship canal.

The railroad in turn gives the city the right to cover its tracks north from Sixtieth street in connection with the building of a new west side express highway.

Property appraisers have been at work for several weeks along the line of the project and have surveyed the properties involved as far north as Seventy-Second street, or practically over half of the right of way. It is expected that work will begin on this improvement before the end of the present year.

ATCHISON, TOPEKA & SANTA FE.—The board of directors has authorized the construction during 1929 of 12 miles of second main track between Burrton, Kan., and Hutchinson. It is also planned to construct three miles of second main track through the yard and make other improvements in trackage facilities at Wynoka, Okla. It is expected that construc-

tion of a stores building at Cleburne, Tex., will be undertaken in 1929.

BALTIMORE & OHIO.—The Interstate Commerce Commission has authorized this company to extend for two miles its Marley Neck branch in Baltimore and Ann Arundel County, Md.; estimated cost including land \$1,530,000.

BALTIMORE & OHIO.—This road has awarded a contract to the Vang Construction Company, Cumberland, Md., for the construction of four bridges on its line about 30 miles south of Pittsburgh, Pa. The total cost of the structures will be approximately \$40,000.

CANADIAN PACIFIC.—This company plans to immediately call for tenders for the construction of an addition to the Empress hotel at Victoria, B. C., which will contain 270 guest rooms with baths. The entire cost of the addition is estimated at \$2,500,000.

CANADIAN PACIFIC.—Plans have been announced by this company for a program for the construction of about 1,200 miles of branch lines which will be submitted to the Canadian Parliament for approval. The branches which it is planned to construct in 1929 would include new lines between Esterhazy, Sask., and Bredenbury; Nipawin, Sask., and Island Falls; Prince Albert, Sask., and Foster Lake; a point near Prince Albert and a point northwest on the Alberta & Great Waterways in Alberta; a point on the branch north from Asquith, Sask., to North Battleford and Meadow Lake; Sutherland, Sask., to Melfort; a point near Trail, B. C., and Metaline Falls, Wash.

CITY OF ST. LOUIS.—This city has opened negotiations with the Missouri Pacific and the St. Louis-San Francisco relative to a division of costs of the construction of the proposed \$408,000 viaduct which will carry Hampton avenue over the two railroads and the River Des Peres. The viaduct will be 1,200 ft. long and 60 ft. wide.

DELAWARE, LACKAWANNA & WESTERN.—This company has awarded a contract to Foley Brothers, Inc., New York, for the construction of a new pier north of Pier 9, North River, New York. The new structure to be known as Pier 10 will be 1,200 ft. in length and 42 ft. wide. Work will be begun on the new pier early in the spring.

LOUISVILLE & NASHVILLE.—A contract has been awarded to the Gould Contracting Company, Nashville, Tenn., for the construction of a bridge over Clear Fork river near Jones, Ky.

MISSOURI PACIFIC.—This company plans the construction of a five-stall addition to the roundhouse at Poplar Bluff, Mo. With other terminal improvements the expenditure at this point is expected to approximate \$100,000. Plans have also been announced for the construction of coach repair facilities at a cost of \$175,000 at Kingston, Tex., to replace those recently destroyed by fire.

Financial

NEW ORLEANS PUBLIC BELT.—This company has applied to the Interstate Commerce Commission for authority to extend its line by erecting a bridge across the Mississippi river immediately above the city of New Orleans, together with approaches, including about 4.2 miles of tracks.

NEW YORK CENTRAL.—This company has awarded a contract to the Robertson Electric Construction Company, Buffalo, N. Y., for the installation of battery charging facilities for mail and baggage trucks at its central station in Buffalo. Another contract has been given to William M. Ballard, Inc., Syracuse, N. Y., for the elimination of a grade crossing at Thendara, N. Y.

PENNSYLVANIA.—This company has awarded a contract to the Pennsylvania Engineering & Construction Co., Lancaster, Pa., for the construction of a sewer in connection with its new passenger station facilities at Lancaster, Pa.

PENNSYLVANIA.—A contract has been awarded to the Ogle Construction Company, Chicago, for the construction of a 500-ton four-track reinforced concrete electric coaling station and sand handling plant, and a reinforced concrete ash pit at South Philadelphia, Pa.; a 50-ton two-track electric steel coaling station and a single-track ash handling plant at Lewistown, Pa.; and for a single-track automatic direct coaler and single-track ash handling plant at Phillipston, Pa. This company plans the immediate construction of a rail-air transfer station at the municipal airport at Columbus, Ohio, for use in coast-to-coast rail-air service in conjunction with the Transcontinental Air Transport, Inc. The building will have platforms and enclosed waiting rooms along both the eastbound and westbound main tracks, the main waiting room and station agent's quarters being located in the airport administration building. Buildings and other facilities to be constructed by the Pennsylvania at Columbus will involve an expenditure of about \$56,000.

PITTSBURGH & WEST VIRGINIA.—A contract has been awarded by this road to the Vang Construction Company, Cumberland, Md., for the construction of 10 miles of new track from Cochran's Mill, Pa., to Monongahela, Pa., at a cost of about \$1,000,000. This is the first section of the proposed extension of this road from Cochran's Mill, Pa., to Connellsville, Pa., a distance of 38 miles.

SAN LUIS VALLEY SOUTHERN.—Articles of incorporation have been filed for the formation of a company which plans to construct an extension of the San Luis Valley Southern from Jaroso, Colo., to Questa, N. M., and Taos, about 50 miles. Incorporators are directors of the present railroad.

YATES & WEST TEXAS.—This company, of which W. A. Moncrieff, Fort Worth, Tex., is president, has applied to the Interstate Commerce Commission for authority to build a line from Rankin to Sheffield, Tex., 30 miles.

ALABAMA & WESTERN FLORIDA.—*Stock.*—The Interstate Commerce Commission has authorized this company to issue \$159,200 of capital stock in connection with the organization of the company and acquisition of the property of the former Birmingham, Columbus & St. Andrews, \$6,000 of which may be sold for cash at not less than par and the proceeds used for working capital.

ATCHISON, TOPEKA & SANTA FE.—*Fresno Interurban Debenture.*—The Interstate Commerce Commission has authorized the Fresno line to issue to the Santa Fe, which leases it, a 6 per cent debenture for \$329,000 in payment of indebtedness. This indebtedness is placed at \$437,278 of which \$329,630 is principal and the balance interest. The Santa Fe proposed to take a debenture of \$350,000 in payment for the entire amount, but the commission authorized only \$329,000, holding that interest is not a proper item for capitalization.

CENTRAL OF GEORGIA.—*Bonds.*—The Interstate Commerce Commission has authorized this company to procure authentication and delivery of refunding and general mortgage, series C, 5 per cent bonds, to be pledged and repledged as collateral security for notes.

CENTRAL INDIANA.—*Abandonment.*—The order of the Interstate Commerce Commission issued in September authorizing this company to abandon its line from Muncie, Ind., to Anderson, from Lebanon to Waveland Jct., and from Sand Creek to Brazil has been modified to require the continuance of operation from Anderson to Advance.

CHESAPEAKE & OHIO.—*Securities.*—The Interstate Commerce Commission has authorized an issue of \$24,784,000 of refunding and improvement 4½ per cent gold bonds, in reimbursement of capital expenditures not heretofore capitalized, to be sold at not less than 92½ and interest. The company had asked authorization of an issue of \$30,000,000 but the commission held that certain expenditures in connection with the acquisition of short lines were not properly capitalizable. Authority was granted to the Chesapeake & Hocking to issue \$14,737,700 of common stock, to be delivered to the C. & O., in payment of indebtedness.

CHICAGO, ROCK ISLAND & GULF.—This company has applied to the Interstate Commerce Commission for authority to construct a line from Groom to Paducah, Tex., 97 miles, stating that with this line and the proposed joint trackage over the Gulf, Texas & Western it will reduce its distance between Amarillo and Fort Worth from 457 to 356 miles.

GULF, BEAUMONT & KANSAS CITY.—*Bond.*—This company has applied to the Interstate Commerce Commission for authority to execute a general mortgage and

issue thereunder bond for \$1,700,000 to the Atchison, Topeka & Santa Fe in satisfaction of indebtedness.

HAMLIN & NORTHWESTERN.—*Charter Granted.*—State officers of Texas have approved the charter of this company which provides for the construction of a railway between Hamlin, Tex., and a point 10 miles northwest, which will be used exclusively for the transportation of freight. The capital stock of the company will be \$10,000.

KANSAS, OKLAHOMA & GULF.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue \$182,000 of first mortgage five per cent bonds series 1978. The bonds are to be sold at the best price obtainable but at not less than 94 which would make the cost to the company 5.346 per cent until arrangements for sale have been made. The bonds may be pledged and repledged as security for short term notes.

MISSOURI-KANSAS-TEXAS.—*New Director.*—Richard H. Swartout of New York, chairman of the board of the Intertype and Dictaphone Corporations, has been elected a member of the board of directors of this company. John W. Platten of New York, chairman of the board of the Chicago & Eastern Illinois and the Gulf, Mobile & Northern, has been elected a member of the executive committee.

MISSOURI PACIFIC.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue \$5,750,000 of first and refunding 5 per cent bonds, series G, to be pledged and repledged as collateral security for short term notes. A similar issue of \$8,198,000 in bonds was authorized in November, in partial capitalization of \$13,948,141 of expenditures. Capitalization of the remainder of these expenditures is now authorized.

SAN DIEGO & ARIZONA.—*Notes.*—The Interstate Commerce Commission has authorized this company to issue to the Southern Pacific and to the J. D. & A. B. Spreckels Securities Company \$3,165,135 of 6 per cent promissory notes, \$1,856,635 of which represent renewals and the remainder payment of cash advances.

SEABOARD AIR LINE.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue \$100,000 of refunding mortgage bonds and \$1,364,000 of first and consolidated bonds, series A, to be pledged and repledged as security for short-term notes.

SEABOARD AIR LINE.—*Bonds.*—The Interstate Commerce Commission has authorized the Florida Western & Northern, the East & West Coast and the Seaboard All-Florida to issue jointly \$1,063,000 of Seaboard All-Florida first mortgage 6 per cent gold bonds, series B, said bonds to be delivered to the Seaboard Air Line in payment for advances made for capital purposes. The Seaboard Air Line has been authorized to assume liability as lessee, guarantor and indorser of these bonds and to pledge and repledge them as security for short-term notes.

ST. LOUIS-SAN FRANCISCO.—Acquisition.—This company has applied to the Interstate Commerce Commission for authority to acquire control, by stock ownership, of the Gulf, Texas & Western, extending from Salesville Junction to Seymour, Tex., 99.1 miles. It is proposed to pay \$2,300,000 for stock and bonds of the company, which is to build an extension of its line as part of an additional through route to Fort Worth, Tex., to be leased to and operated by the St. Louis, San Francisco & Texas.

TEXAS & PACIFIC.—Acquisition.—This company has applied to the Interstate Commerce Commission for authority to acquire control of the Texas Short Line, which has a line between Grand Saline and Alba, Tex., 14 miles, by acquisition of its stock and bonds for \$175,000 in cash.

TOLEDO TERMINAL.—Bonds.—This company has applied to the Interstate Commerce Commission for authority to issue and sell \$500,000 of first mortgage 4½ per cent bonds at not less than 92 upon competitive bids but not at public sale, to reimburse its treasury.

TRINITY & BRAZOS VALLEY.—Receiver's Certificates.—The Interstate Commerce Commission has authorized the receiver of this company to issue \$100,000 of fifth-series receiver's certificates to be sold at face value for the purpose of purchasing three gas-electric cars and refurnishing passenger cars to operate as trailers.

WABASH.—Equipment Trust.—This company has applied to the Interstate Commerce Commission for authority for an issue of \$3,375,000 of equipment trust certificates, for which it proposes to invite bids in the alternative on a 4½ per cent and a 5 per cent basis.

WAYCROSS & SOUTHERN.—Abandonment. This company has applied to the Interstate Commerce Commission for authority to abandon its entire line, from Hebardville to Hopkins, Ga., 20 miles, on the ground that there is no longer sufficient traffic for the weekly train service which has been operated.

YANKTON, NORFOLK & SOUTHERN.—Increased Capitalization.—This company has filed an amendment to its articles of incorporation in South Dakota, increasing its capitalization from \$1,000,000 to \$2,000,000.

Dividends Declared

International Railways of Central America.—Preferred, 1¼ per cent, quarterly, payable February 15 to holders of record January 31.

New Orleans, Texas & Mexico.—1¼ per cent, quarterly, payable March 1 to holders of record February 15.

Norfolk & Western.—Common, \$2.00, quarterly, payable March 19 to holders of record February 28.

Average Prices of Stocks and of Bonds

	Jan. 22	Last week	Last year
Average price of 20 representative railway stocks.	132.83	130.43	120.18
Average price of 20 representative railway bonds.	92.32	92.59	97.55

Officers

Executive

V. S. Andrus, assistant to the general manager of the Southern Pacific, has been promoted to assistant to the vice-president, with headquarters as before at San Francisco, Cal.

H. M. Adams, president of the Western Pacific, with headquarters at San Francisco, Cal., has also been elected president of the Sacramento Northern, which has acquired the San Francisco-Sacramento, succeeding **G. F. Detrick**. **Charles Elsey**, who has been vice-president and treasurer of the Sacramento Northern and treasurer of the San Francisco-Sacramento, and **H. A. Mitchell**, who has been vice-president, general manager and purchasing agent of San Francisco-Sacramento, have been elected vice-presidents of the Sacramento Northern. **E. E. Bates**, treasurer of the Western Pacific, has also been elected treasurer of the Sacramento Northern. **F. A. Ewerger** has been appointed auditor of the Sacramento Northern.

Andrew P. Titus, who resigned as chief operating officer of the Chicago & Alton on January 16 to become vice-president in charge of operation and traffic of the Illinois Terminal System,



Andrew P. Titus

with headquarters at St. Louis, Mo., has been in railway service for more than 36 years. He was born on April 11, 1875, on a farm near Princeton, N. J., and attended Princeton Preparatory School and Princeton College, entering railway service on July 1, 1890, in the car department of the Lake Shore & Michigan Southern (now part of the New York Central) at Cleveland, Ohio. From 1893 to 1895 Mr. Titus was connected with a mining company in Mexico, then returning to the L. S. & M. S. In May, 1900, he was appointed car distributor and chief clerk to the Superintendent of car service of the Wheeling & Lake Erie, being promoted to

superintendent of car service at Pittsburgh, Pa., in November, 1905, to assistant superintendent at Canton, Ohio, in May, 1907, and later to superintendent at Canton. He first entered the service of the Alton in September, 1912, as general superintendent at Chicago. In November, 1915, he was further promoted to general manager, with headquarters at the same point, and in February, 1922, he was elected vice-president in charge of operation. When the Alton went into receivership Mr. Titus' title was changed to chief operating officer, with headquarters as before at Chicago.

Arthur P. Russell, vice-president of the New York, New Haven & Hartford in charge of public relations, real estate, industrial development, valuation and insurance, and president of the New England Transportation Company, the New Haven's motor coach operating



Arthur P. Russell

subsidiary, was elected executive vice-president of the road at a meeting of the board of directors, held in New York on January 22. Mr. Russell's headquarters will remain at Boston, Mass., as heretofore, but he will also maintain an office at New Haven, Conn. He will continue in charge of the departments which he has been directing and also as president of the highway subsidiary while in addition he will represent the New Haven in all matters in Massachusetts and Rhode Island. Mr. Russell was born on June 16, 1871, at Leominster, Mass., and first entered railway service in 1888 as office boy in the executive office of the New York & New England. He was promoted successively until he became chief clerk to the secretary of that company and later secretary to its vice-president and general manager. In 1898, when the New York & New England was leased to the New Haven, he was appointed chief clerk in the law department of the former for Massachusetts and was admitted to the Massachusetts bar in 1907. Subsequently he became assistant attorney at Boston and from 1910 to 1913 acted as the New York & New England's legislative counsel in Massa-

chusetts. In 1914 Mr. Russell was transferred to the New Haven and placed in charge of that roads newly organized valuation department. He remained in that position until February 1, 1918, when he became, in addition, federal counsel in charge of relations with the government, including the Interstate Commerce Commission. On July 1, 1918, when government control separated operation from the corporate affairs of the road, Mr. Russell remained with the corporation as assistant general counsel and corporate commissioner of real estate. He continued in that capacity until March 1, 1920, when he became vice-president. During the same year he was appointed chairman of the New Haven's industrial development committee. Mr. Russell, in his capacity as president of the New England Transportation Company, has been a leader in railway motor transport affairs. He was prominently identified with the organization of the Railroad Motor Transport Conference and served as chairman of this forerunner of the Motor Transport Division of the American Railway Association, which division he has headed since its formation.

Financial, Legal and Accounting

F. W. Chiswell, claim agent on the Los Angeles & Salt Lake at Salt Lake City, Utah, has been promoted to general claim agent, with headquarters at Los Angeles, Cal.

James S. Moore, Jr., general attorney of the Western Pacific, with headquarters at San Francisco, Cal., has resigned to become associated with the law firm of Brobeck, Phleger & Harrison at San Francisco.

E. E. Mc Innis, general solicitor of the Atchison, Topeka & Santa Fe, with headquarters at Chicago, has been appointed also general solicitor of the Kansas City, Mexico & Orient and the Kansas City, Mexico & Orient of Texas.

J. Raymond Barse, acting general counsel of the Chicago & Western Indiana and the Belt Railway of Chicago, has been elected general counsel of these two companies, with headquarters as before at Chicago, succeeding **C. G. Austin, Jr.**, vice-president and general counsel, who resigned from that position on January 1, following a six-months' leave of absence. Mr. Barse has been in the service of the C. & W. I. and the Belt Railway for 13 years. He was born at Minneapolis, Minn., on September 6, 1884, and graduated from the Minneapolis high school and the Illinois Law School at Chicago, being admitted to the bar in Illinois. His first railway work was with the C. & W. I. and the Belt in January, 1913, and in the following year he became connected with the office of the general counsel of the Chicago & Erie

(now part of the Erie). In 1917 Mr. Barse returned to the C. & W. I. and the Belt as general attorney, a position he held until his appointment to acting general counsel on July 1, 1928.

Thomas Balmer, who has been promoted to western counsel of the Great



Thomas Balmer

Northern, with headquarters at Seattle, Wash., was born at Danville, Ill., on July 29, 1888. He graduated from the Seattle High school and the Law school of the University of Washington, entering railway service on the Great Northern as a stenographer in the legal department at Seattle on February 27, 1907. Two years later he was advanced to law clerk and in February, 1912, he was promoted to assistant attorney at Spokane, Wash. From May, 1918, to October, 1926, Mr. Balmer served successively as attorney for Idaho and Eastern Washington at Spokane and as attorney for Oregon and Western Washington at Seattle. He was then promoted to assistant general counsel, with headquarters at St. Paul, Minn. His further promotion to western counsel became effective on January 1.

Reginald H. M. Temple, assistant general counsel of the Canadian Na-



Reginald H. M. Temple

tional, with headquarters at Montreal, Que., has been appointed general counsel, with the same headquarters, suc-

ceeding **W. C. Chisholm**, deceased. Mr. Temple was born at Toronto, Ont., on May 25, 1876. He was educated at Upper Canada College, Trinity University and Osgoode Hall, and entered railway service in 1906 in the construction accounting department of the Canadian Northern Railway, now a part of the Canadian National. The following year he was appointed claims agent for that road, and in 1909 he was appointed assistant solicitor at Toronto, later being promoted to the position of general solicitor. Mr. Temple was appointed regional counsel in April, 1919, in addition to acting as claims agent. He held this position until May, 1926, when he was promoted to assistant general counsel at Montreal.

Operating

Harry H. Henderson, who has been appointed assistant general manager of the Wheeling & Lake Erie and the Lorain & West Virginia, with headquarters at Cleveland, Ohio, has been in the service of the former railway for nearly 30 years. He was born on November 7, 1882, at Nazarre, Ohio,



Harry H. Henderson

and entered railway service at the age of 16 years as a maintenance of way painter on the W. & L. E. Mr. Henderson served successively from 1904 to 1910 as clerk and chief clerk to the roadmaster and superintendent of bridges and buildings, as chief clerk to the consulting and construction engineer, as chief clerk to the chief engineer and as a clerk in the office of the auditor. In August, 1910, he was promoted to shop accountant and later to auditor of shop and division accounts, remaining in the latter position until November 1, 1918, when he was appointed federal auditor of the W. & L. E. When the railroads were relinquished from federal control on March 1, 1920, Mr. Henderson was appointed auditor of the W. & L. E., with headquarters at Cleveland. His appointment as assistant general manager became effective on January 1.

W. R. Winkler, chief dispatcher on the Louisville & Nashville at Irvine, Ky., has been promoted to assistant trainmaster at Hazard, Ky.

L. W. Haley, assistant yardmaster on the New York division of the Pennsylvania, has been promoted to assistant trainmaster on the Indianapolis division.

W. R. Elsey, master mechanic of the Pennsylvania, with headquarters at Orangeville, Md., has been appointed acting superintendent of floating equipment, New York Zone, with headquarters at New York, succeeding **F. L. DuBosque**, who has been granted a leave of absence.

R. W. Lang has been appointed supervisor of wage schedules of the Pacific lines of the Southern Pacific, with headquarters at San Francisco, Cal.

Traffic

Frank M. Miller has been appointed general western agent of the Terminal Railroad Association of St. Louis, with headquarters at Los Angeles, Cal.

W. D. May, commercial agent for the St. Louis Southwestern at Memphis, Tenn., has been promoted to assistant general freight agent at the same point.

G. C. Dickens, general agent of the Alaska Railroad at Washington, D. C., has been promoted to general freight, passenger and immigration agent, with headquarters at Chicago.

W. F. Goodknight, commercial agent for the Northern Pacific at Chicago, has been promoted to general agent at Cincinnati, Ohio, replacing **W. C. Hartnett**, deceased. **Robert H. McCurdy**, district passenger agent at Des Moines, Iowa, has been promoted to general agent of the passenger department at Cincinnati.

C. A. Overton, Jr., local passenger agent of the Norfolk & Western at Richmond, Va., has been appointed district passenger agent at that point, succeeding **John E. Wagner**, promoted. Mr. Overton will have charge of the solicitation of passenger traffic in the Richmond and Norfolk district, reporting to the general passenger agent at Roanoke, Va. This appointment is effective February 1.

Earl W. Ireland, general agent of the passenger department of the Chicago Great Western at Chicago, has been promoted to assistant general passenger agent with headquarters at Kansas City, Mo., succeeding **Henry E. Bulla**, resigned. **Thomas G. Kees**, district passenger agent at Chicago, has been promoted to general agent of the passenger department at that point, succeeding Mr. Ireland.

The Western Pacific has abolished the office of vice-president in charge of traf-

fic, with headquarters at San Francisco, Cal., and **Eugene Fox**, who held that position, has temporarily retired from railway service because of ill health. The supervision of the passenger traffic department and the freight traffic department has been assumed by **Bode K. Smith**, passenger traffic manager and **H. K. Faye**, freight traffic manager, respectively, reporting directly to the president.

J. H. Day, who has been promoted to freight traffic manager of the New York, Chicago & St. Louis, with headquarters at Cleveland, Ohio, has been connected with that railway for more than 22 years. He was born at Cleveland on July 12, 1888, and entered railway service as an office boy for the commercial agent of the Nickel Plate in that city on July 1, 1906. During the following 18 years he was advanced through various positions in the traffic department, including those of assistant chief clerk and chief clerk in the general freight office. On October 15, 1924, Mr. Day was promoted to division freight agent at Fort Wayne, Ind., where he remained until February 1, 1926, when he was again promoted to assistant general freight agent at Cleveland. In February, 1927, he became general freight agent, with headquarters at Cleveland, and in July of the same year he was appointed acting freight traffic manager. Mr. Day's promotion to freight traffic manager became effective on January 1.

John H. McClure, who has been promoted to general freight and passenger agent of the Southern Pacific, with headquarters at Phoenix, Ariz., has been connected with that company for 27 years. He was born at Decatur, Ala., on February 19, 1874, and graduated from high school in May 1892. In



John H. McClure

April, 1894, Mr. McClure entered railway service with the Louisville & Nashville as a local station agent. For the following four years he served in that capacity at various points on the L. & N. between Montgomery, Ala., and Decatur and in the Fall of 1898 he became assistant train dispatcher at Birmingham,

ham, Ala. During 1901 and 1902 he served as ticket seller at an important ticket office on the L. & N., where he remained until January 27, 1902, when he was appointed relief station agent on the Southern Pacific at Tucson, Ariz. Later Mr. McClure served successively as relief station agent at various points between El Paso, Tex., and Yuma, Ariz., as local station agent at Lordsburg, N. M., as local freight agent at Tucson, as assistant district freight and passenger agent at Santa Barbara, Cal., and as district freight and passenger agent at Reno, Nev. On July 1, 1928, he was promoted to assistant general freight and passenger agent at Phoenix. His promotion to general freight and passenger agent at Phoenix became effective on January 1.

Engineering, Maintenance of Way and Signaling

William C. Perkins, roadmaster of the Yellowstone district of the Oregon Short Line, has been promoted to division engineer of the Montana division, with headquarters as before at Pocatello, Idaho.

M. H. Browne, Jr., division engineer of the Montana division of the Oregon Short Line, has been transferred to the Utah division, with headquarters as before at Pocatello, Idaho. Mr. Browne replaces **E. E. Moberly**, who has been transferred to the Idaho division, with headquarters at Pocatello.

George K. Farner, assistant engineer on the Chicago, Milwaukee, St. Paul & Pacific, has been promoted to division engineer at Beloit, Wis., succeeding **W. H. Blanchard**, who has been transferred to Green Bay, Wis. Mr. Blanchard replaces **Peter Jenny**, who resigned on January 1 to engage in other business. **R. A. Whiteford**, assistant engineer at Minneapolis, Minn., has been promoted to division engineer at the same point, succeeding **N. F. Podas**, who has been promoted to office engineer on special assignment at Minneapolis.

R. T. Davis, assistant division engineer of the Susquehanna and Tioga divisions of the Erie, with headquarters at Hornell, N. Y., has been appointed division engineer of the Delaware and Jefferson divisions, with headquarters at Susquehanna, Pa., succeeding **C. M. Lewis**, who has been transferred as division engineer to the Alleghany and Bradford divisions, with headquarters at Salamanca, N. Y., replacing **J. G. June**, deceased. **R. L. Dyke**, division engineer of the Susquehanna and Tioga divisions, with headquarters at Hornell, has been transferred in the same capacity to the Buffalo and Rochester divisions, with headquarters at Buffalo, N. Y., succeeding **G. W. Graves**, who will in turn replace Mr. Dykes as division engineer at Hornell.

L. W. Althof, who has been promoted

to engineer of maintenance of way of the Oregon Short Line, with headquarters at Pocatello, Idaho, has been connected with that railway and the Union Pacific for 17 years. He was born on July 31, 1886, at Oakland, Cal., and graduated from the University of California, entering railway service in December, 1908, as a draftsman on the Southern Pacific. Three years later Mr. Althof was appointed assistant engineer on the Oregon Short Line, then serving until October, 1916, in various capacities in the track and bridge and building departments when he was appointed assistant engineer on special investigations and the construction of reinforced concrete snowsheds on the Union Pacific. From February, 1918, to April, 1923, he was connected with the Merchants Shipbuilding Corporation as superintendent of hull construction, returning to railway service on the latter date as assistant engineer on the Oregon Short Line. He was promoted to division engineer of the Idaho divi-



L. W. Althof

sion, with headquarters at Pocatello, in April, 1925, the further promotion to engineer of maintenance of way becoming effective on January 1.

Purchases and Stores

David E. Reynolds, who has been appointed purchasing agent of the Bessemer & Lake Erie and the Union Railroad, with headquarters at Pittsburgh, Pa., was born on September 27, 1886, in Pittsburgh. He was educated in the grammar and high schools and entered railway service with the Bessemer & Lake Erie on May 1, 1907, as stenographer and clerk. On October 1, 1918, he was appointed chief clerk in the purchasing department of the Union Railroad and the Bessemer & Lake Erie and he held this position until his recent appointment as purchasing agent of these roads.

George W. Leigh, who has been promoted to purchasing agent of the Minneapolis, St. Paul & Sault Ste. Marie, the Duluth, South Shore & Atlantic and the Mineral Range, with headquar-

ters at Minneapolis, Minn., has been in the service of the former railway for 27 years. He was born on June 22, 1879, at Orillia, Ont. After completing a college education he entered railway service on July 1, 1901, on the Soo line. In 1913 Mr. Leigh was promoted to assistant general storekeeper, with headquarters at Minneapolis. He was again promoted to general storekeeper of the Soo line, the D., S. S. & A. and the



George W. Leigh

Mineral Range in 1920, being appointed to the added position of assistant purchasing agent in July, 1926. His promotion to purchasing agent of the three railroads became effective on January 1.

Special

William M. Gordon, superintendent of the Canadian Pacific Express Company at Vancouver, B. C., has been promoted to general superintendent of the Western lines, with headquarters at Winnipeg, Man., succeeding **Goodwin Ford**, who has retired after 43 years of continuous service with that company.

Lewis Stockett, general superintendent of the coal mines branch of the department of natural resources of the Canadian Pacific, with headquarters at Calgary, Alta., retired from active service on January 1, after 53 years with mining and railway companies. Mr. Stockett was mining engineer of the Great Northern and general manager of the Great Northern Coal Mines from 1895 to 1905 and had been with the Canadian Pacific since 1905.

Byron S. Harvey, who has been elected president of Fred Harvey, Inc., with headquarters at Kansas City, Mo., has been connected with that organization for more than 28 years. He was born on August 31, 1876, at Leavenworth, Kan., and graduated from Phillips Academy, Andover, Mass., in 1895 and from the Sheffield Scientific School of Yale University in 1898. In the following year Mr. Harvey entered the service of the railway restaurant business, owned by his father, Fred

Harvey, at Kansas City. In 1903 he became manager of the Chicago office of the business and in 1919 he was



Byron S. Harvey

elected vice-president of Fred Harvey, Inc., with headquarters at Chicago. His election as president to succeed his brother, Ford Harvey, who died on December 13, became effective on December 24.

Obituary

J. G. June, division engineer of the Allegheny and Bradford divisions of the Erie, with headquarters at Salamanca, N. Y. died on December 31, 1928.

William H. Thompson, general freight agent of the Missouri Pacific at St. Louis, Mo., died in the Missouri Pacific Hospital in that city on January 18, following a ten days illness from pneumonia.

Herbert Wiley, general agent of the passenger department of the Chicago, Indianapolis & Louisville at Chicago, Ill., died on January 16, at his home at Brookfield, Ill.

Van Ebert, assistant trainmaster on the Renovo division of the Pennsylvania at Kane, Pa., died in that city on December 28. Mr. Ebert had been in the service of the Pennsylvania for more than 43 years.

D. D. Cutler, who was general livestock agent of the Chicago & North Western from 1897 until his retirement from active service in 1920, died at his home at Cedar Rapids, Iowa, on January 17, following an attack of pneumonia. Mr. Cutler was 78 years of age.

William R. Harley, secretary of the Minneapolis, St. Paul & Sault Ste. Marie, the Duluth, South Shore & Atlantic and the Mineral Range, who died at Minneapolis, Minn., on January 10, had been in railway service for 42 years. He was born at Glasgow, Scotland, on July 8, 1862, and came to the United States in 1883. In 1886 he entered the passenger department of the Wisconsin Central (now part of the Soo line) at Milwaukee, later being transferred to

Chicago. Mr. Harley was appointed assistant secretary of the Soo line in 1918 and had been secretary of that railroad and its subsidiary companies since 1922.

Charles H. Winders, western counsel of the Northern Pacific, with headquarters at Seattle, Wash., died at his home in that city on January 17, after an illness of nearly a year. He was born in 1877 and after attending Knox College, he served in the Spanish-American war. Following his discharge from the army he worked in the government pension bureau at Washington, D. C., while attending a law school. Mr. Winders entered railway service in August 1905, as an assistant attorney on the Northern Pacific at Seattle. In 1912 he was promoted to attorney at that point and ten years later he was further advanced to assistant western counsel, with headquarters at Seattle. He had been western counsel since January 1, 1928.

Edward J. Fenchurch, general freight and passenger agent of the Southern Pacific, with headquarters at Phoenix, Ariz., died at Tucson, Ariz., on December 7, following an attack of double pneumonia. Mr. Fenchurch was born at Stratford-on-Avon, England, on May 28, 1870, and entered railway service in that country when 17 years of age. Several years later he came to the United States and in 1902 he was connected with the Illinois Central at Memphis, Tenn. Later he was located in Chicago and in 1908 he entered the general freight office of the Southern Pacific at San Francisco, Cal. The following year he was promoted to chief rate clerk at Tucson and in 1915 he was advanced to chief clerk at that point. In 1918 Mr. Fenchurch was promoted to assistant general freight and passenger agent at Tucson. He had been general freight and passenger agent at Phoenix since 1924.

John C. Eden, former western traffic manager and assistant general traffic manager of the Great Northern, died at Seattle, Wash., on January 14. Mr. Eden was born on October 17, 1864, at Goderich, Ont. He entered railway service at the age of 16 years as a manifest clerk on the Grand Trunk (now part of the Canadian National) at Buffalo, N. Y. During the following 22 years he served successively as telegraph operator on the Grand Trunk, telegraph operator, agent and train dispatcher on the Chicago, Milwaukee & St. Paul, agent, traveling passenger agent, commercial agent and general agent on the Minneapolis, St. Paul & Sault Ste. Marie, and general freight agent and traffic manager of the Eastern Railway of Minnesota (now part of the Great Northern). From 1902 to 1905 Mr. Eden was successively western traffic manager and assistant general traffic manager of the Great Northern at Seattle. Since June, 1905, Mr. Eden had been president of the Superior Portland Cement Company and for a portion of that time he had been president

of the Baker River & Shuksan (whose operations are now discontinued).

Charles Henry Kluegel, chief engineer of the Oahu Railway & Land Company, with headquarters at Honolulu, T. H., died at Queens hospital in that city on January 10, following a ten-weeks' illness. Mr. Kluegel was born on February 27, 1847, at Cleveland, Ohio, and after attending high school in that city graduated from a course in civil engineering at Union College. He first served as an assistant engineer and roadmaster on the San Francisco & San Jose (now part of the Southern Pacific) from 1868 to 1870. For the next 11 years he was engaged in municipal, county and state engineering on water-supply systems, irrigation works and land surveys in California and in 1881 he became a locating engineer on the Mexican Central and later on the Northern Pacific. After locating town-sites, logging railways and water works from 1884 to 1888 he was appointed chief engineer of the Oahu Railway, serving in this capacity until 1906. From 1899 to 1902 he was also chief engineer of the Hilo Railroad. During the period from 1907 to 1919, Mr. Kluegel served successively on preliminary railway surveys in California, as assistant superintendent of public works in Hawaii, as chief engineer of the Hilo Railroad, as inspecting and consulting engineer of the Waiahole Water Company and as a government inspector on breakwater construction and harbor dredging at Hilo, T. H., and Kahului. Mr. Kluegel had been chief engineer of the Oahu Railway & Land Company since 1919.

Albert F. Robinson, bridge engineer of the Atchison, Topeka & Santa Fe, with headquarters at Chicago, died at his home in Oak Park, Ill., on January 20. He had been bridge engineer of the Santa Fe for more than 33 years. Mr. Robinson was born at Henry, Marshall County, Ill., on October 12, 1854, and graduated from the University of Illinois in June, 1880. In the following year he entered railway service as a chainman on the Denver & Rio Grande, returning to the University of Illinois in the winters of 1881 and 1882 to engage in post-graduate work on bridges. In 1882 and in 1883 he served as bridge engineer of the Chicago & Alton, then becoming assistant calculator and estimator for Kellogg & Maurice, engineers at Athens, Pa. From July, 1884, to May, 1889, he was consecutively bridge engineer of the Santa Fe and of the Chicago, Burlington & Northern (now part of the Chicago, Burlington & Quincy) and he then became connected with E. L. Corthell, civil engineer at Chicago. In 1891 and 1892 Mr. Robinson was with Purdy & Phillips, structural engineers at Chicago, returning to railway service in June of the latter year as assistant engineer on the lines of the Chicago, Rock Island & Pacific west of the Missouri river. Following two years of private engineering practice,

Mr. Robinson was appointed bridge engineer of the Santa Fe, with headquarters at Topeka, Kan., in November, 1896. His headquarters were moved to Chicago in 1904.

John E. Dalrymple, former vice-president in charge of traffic and express of the Canadian National at Montreal, Que., died in that city on January 18, from pneumonia. Mr. Dalrymple was born on January 1, 1869, at Montreal, Que., and entered railway service on July 1, 1883, as a junior clerk in the treasurer's office of the Grand Trunk. He was secretary to the traffic manager of the Chicago & Grand Trunk (now a part of the Grand Trunk Western) at Chicago from April, 1890, to February, 1896, and from the latter date until May, 1899, he was secretary to the general traffic manager of the Grand Trunk System at Montreal. He was division freight agent for the same road at Hamilton, Ont., until August, 1899, and he then became division freight agent and manager of the Grand Trunk Dispatch Line at Detroit, Mich. He held this position until May,



John E. Dalrymple

1900, and from that date until March, 1901, he was general freight agent for the Central Vermont at St. Albans. He then served as assistant to the second vice-president and general manager of the Grand Trunk System. In April, 1902, he was again appointed general freight agent of the Central Vermont, later serving as general freight agent of the Grand Trunk at Montreal, where he remained until May, 1908. Mr. Dalrymple was appointed assistant freight traffic manager of the Grand Trunk Pacific in May, 1908, and from June, 1910, until October, 1911, he also occupied the same position on the Grand Trunk Pacific Coast Steamship Company. He was vice-president of the Grand Trunk System, the Central Vermont, the Grand Trunk Pacific and the Grand Trunk Pacific Coast Steamship Company from October, 1911, to August, 1920, when he was appointed vice-president of the Grand Trunk, Central Vermont and affiliated lines. In March, 1923, Mr. Dalrymple became vice-president in charge of traffic of the Canadian National, which position he held until December, 1926, when he retired from the service.

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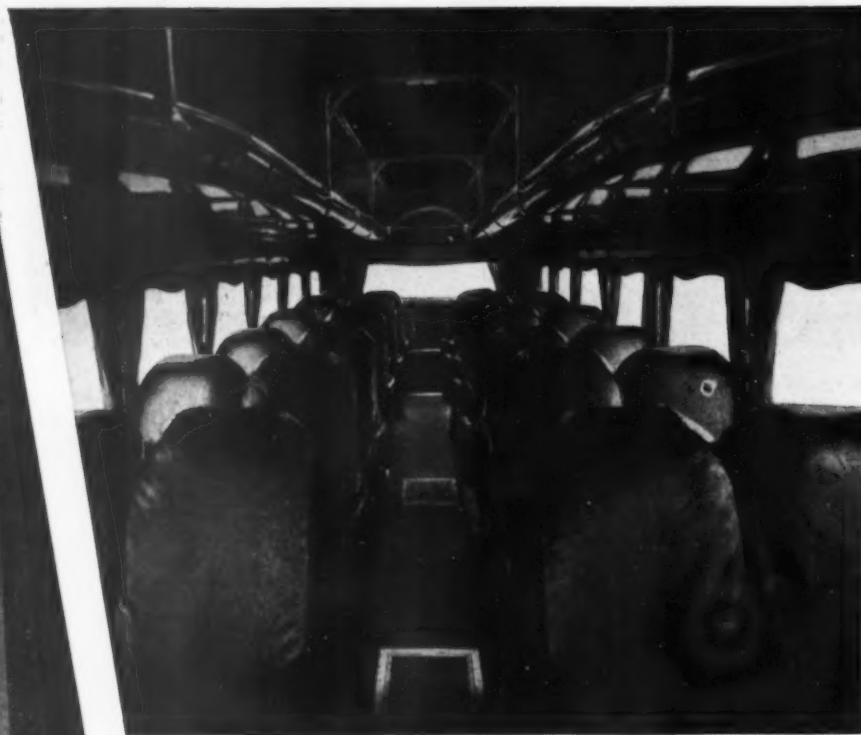
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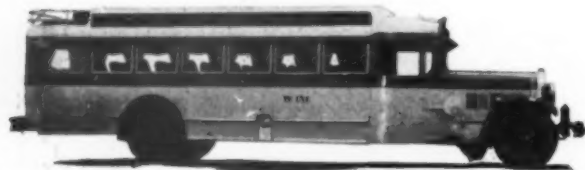
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 **BENDER BODIES**

Railway Age

Motor Transport Section

*Devoted to the
Co-ordination of Railway and Highway Service*

Vol. 86, No. 4

January 26, 1929

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The Next Meeting of the Motor Transport Division

NOTICE of the next meeting of the Motor Transport Division of the American Railway Association has already been sent out by the general committee and it is urged that as large a number of railway officers as possible arrange to attend the sessions. The meeting will be held at St. Louis, Mo., on February 26, 27 and 28, and March 1, the first three days being devoted to hearing the reports of the committees of the motor coach, motor truck and rail motor car sections, and the last day to an open meeting to which representatives from the various organizations of manufacturers and operators of motor vehicles have been invited. The selection of St. Louis as the meeting place was particularly fortunate in view of the fact that there are located in that city one of the outstanding tractor and trailer operations of the railways and the headquarters of two roads, the Missouri Pacific and the St. Louis Southwestern, which have quite recently launched programs of motor coach and motor truck operation on a system-wide basis. The general committee of the division makes a particular point of urging that other officers, in addition to those appointed as the official representatives of their companies, attend the meeting. At the last meeting of the division held in Detroit, Mich., a considerable number of passenger traffic officers were in attendance for the first time. In view of the equal interest and importance of the reports of the motor truck section of the division, it is considered that many freight traffic officers, likewise, could well afford to be present.

"What Results From Motor Coach Operation?"

AT a recent meeting of the New York Railroad Club, three railway officers in charge of the motor coach operations of their respective railways told in some detail of the advantages which their companies have gained through the operation of motor vehicles. The operations described were those of the Boston & Maine, the New York, New Haven & Hartford and the Reading. The first two companies have been operators of motor coaches, co-ordinated with their trains, for several years, while the last has been using motor coaches for a little less than one year. Nevertheless, their experiences have been substantially the same. They have found that motor vehicles in many instances can provide as good or better local passenger transportation than trains, and at a substantially lower cost. In several instances, motor coach operations have recovered some of the passenger traffic which the trains had lost to competitive motor coaches or to private automobiles.

Two of these three companies are making money out of their motor coach operations, while the other has sustained small losses in most years. On the other hand, all three motor coach operations have enabled the railways to eliminate a large amount of passenger train service, with consequent large savings to the railways in their operating expenses. An article based upon the addresses presented at the New York Railroad Club meeting referred to is published in this issue. Based upon the experience in motor coach operation of three railways most prominent in this field, it contains information which should be of material value to railway officers confronted with the problem of declining passenger revenues and disproportionately high operating expenses.

Tractors and Trailers to Reduce Operating Costs

ACLEAN cut example of the reduction of operating costs possible through the operation of tractors and trailers is afforded by the Chicago, Rock Island & Pacific. The Rock Island is operating a tractor and four trailers between its downtown freight station at Taylor street, Chicago, and its freighthouse at Blue Island, Ill., serving intermediate stations also, in substitution for trap car operation. This substitution was effected three and one-half years ago and has been highly successful. The following benefits have been derived from the tractor and trailer operation, according to Rock Island officers. In the first place, the business has been handled by motor vehicle at a cost substantially less than the estimated cost of providing service by trap car. With conservative estimates of the cost of trap car operation, it appears that the tractor and trailers have effected a 33 per cent reduction in the cost of rendering this terminal service. Furthermore, the tractor and trailers are giving a much more frequent service to the stations affected than was given by the trap cars previously operated. Two round trips per day are made by the motor vehicles between Chicago, Englewood and Blue Island, and one round trip per day to each of the other stations served. Previously trap cars to and from these stations were operated not more than once a day and, in most cases, not more than two or three times each week. As a result, the service rendered to shippers has been materially improved, and savings of from 24 to 48 hours in time in transit to and from these stations have been made possible. This faster service has resulted in some increased business for the Rock Island. Another benefit has been that freight cars formerly used in the trap car service have been released for other work of a more profitable character. Still another benefit has been the fact that valuable track space at the various

freight stations, which was formerly required by the trap cars, has also been released. This is of particular advantage at the Taylor street freighthouses in Chicago, which are in congested territory. An article describing this tractor and trailer operation of the Rock Island is published on another page of this issue. It is a description of an outstandingly successful utilization of motor vehicles by a railway.

The Hearing on Container Service

THE Interstate Commerce Commission hearing on the use of containers, scheduled for February 6, is one which railway officers interested in the co-ordination of railway and highway freight transportation will follow with a great deal of interest. There can be no question but that the unit container, in some situations at least, is a device which properly used can offer certain advantages to both the shipper and the railroad. Are there, on the other hand, some important offsetting disadvantages? That there are some—at least in the details of working out the service and rates—is manifest by the fact that there are some interests, including railroads, which are opposing the provision of this service. It is well that an unbiased investigation into the whole matter is going to be made. Both the advocates of container service and its opponents can welcome an opportunity to be heard in full. Undoubtedly there are some believers in the innovation who have not fully studied out all the complexities which its general adoption might give rise to in the general rate structure. At the same time, there is a possibility that among those who object to the use of containers in railroad service there is not a complete knowledge of ways and means by which certain concrete objections to the device may be met without discarding it entirely. On the surface it seems easily possible that the problems arising from a general provision of container service by the railroads when all the considerations are fully known might be found to be fully as complex as the question of store-door collection and delivery of freight. That the question will be thoroughly studied is assured by the selection of I. C. C. Examiner Ames, who has had experience with other questions involving rail and highway co-ordination in which he has had shown a considerable understanding of the problems involved, to sit with Commissioner Porter on the case. These hearings will be reported in the *Railway Age* and the *Motor Transport Section* so that all railroad men interested in the problem may study it currently in the light of the testimony offered.

The Motor Transport Situation

THE relationship between motor transportation and railway transportation has been subject to constant change in each of the years which have passed since the former became an established form of common carrier transportation. The year 1928 was no exception. Briefly, there occurred in 1928 several major changes in motor transportation as a competitor of railway transportation and similarly major changes in motor transport as an adjunct to the railways.

Complete statistics for the year are not yet available, but, on the basis of statistics for the major part of the year, it is estimated that, while there has been an increase in the number of common carrier motor coaches

and motor trucks in operation, this increase has been considerably smaller than the increases which had been registered in previous years. Similarly, the number of miles of route covered by motor coaches and motor trucks increased less rapidly during 1928 than it did in 1927 and the several years before that. From these facts, it appears that the period of very rapid spread in motor transportation has ended, and that such increases as may be made in the future will be relatively small.

It is estimated that there has been a substantial decrease in the number of companies engaged as independent operators of common carrier motor vehicles. This has been due to consolidations of small companies into large organizations operating extensive systems of highway lines. Several consolidations of major character were effected during 1928, several of them involving more than 100 small individual operations. Out of these consolidations have developed so-called trans-continental motor coach lines, some of which operate over the highways from coast to coast but most of which have lines which, while very long, extend only part way across the continent. These lines, which offer low rates as the principal inducement to traffic, appear to be doing a substantial business.

Most of the common carrier motor truck lines are still operating on a comparatively small scale, but the small motor coach operator seems sure to give way more and more to the larger systems. In other words, the era of consolidation in railway history is now being duplicated by an era of consolidation in the motor coach operating industry. It is obvious that the motor coach as a competitor of the railways will be strengthened by this development.

As adjuncts to railway service, the motor coach and the motor truck continued during 1928 to assume a place of increasing importance. It appears that experiments on the part of the railways with motor coach and motor truck operation are now largely a thing of the past. Enough roads have tested motor vehicles in their own uses over extended periods of time to enable all of the railways to determine with reasonable accuracy just how motor coaches and motor trucks can be of use to them. The result of this was apparent during 1928 when individual experimental motor coach and motor truck installations were at a minimum, and, on the other hand, several announcements of plans for system-wide motor vehicle operation were made. It is expected that most of the railways which will undertake motor coach or motor truck operation this year for the first time will proceed with their plans on a similarly large-scale basis. This view is strengthened by the announcement of the Pennsylvania of its plans for extensive motor coach service throughout its entire territory and by the rapid expansion of the Southern Pacific's and Missouri Pacific's highway operations, now being accelerated by the purchase of independent operators.

Motor coaches and motor trucks operated by the railways during 1928 continued to be used largely in replacing or supplementing passenger or freight train service on branch lines, their purposes being to reduce operating costs and to regain lost traffic. In addition to these uses, however, there was apparent a growing tendency to use motor vehicles to create new business, such as tourist travel.

The Motor Transport Division of the American Railway Association is now firmly established and has held several successful meetings. It is expected to be a factor in the continued and more rapid spread of motor transport operations by the railways during 1929.

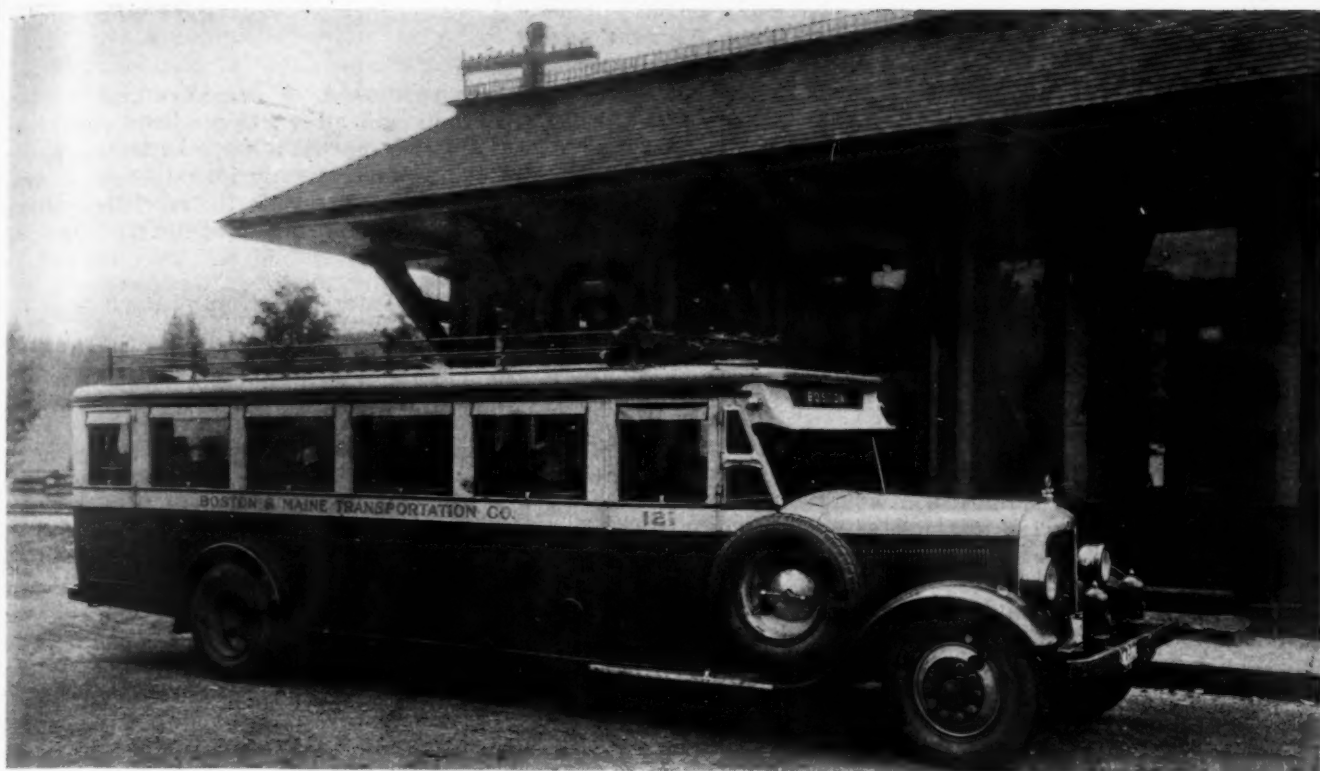
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A Boston & Maine Motor Coach at Twin Mountain, N. H.

What Results From Motor Coach Operation?

Benefits are described by officers in charge of Boston & Maine, New Haven and Reading highway services

THE results being secured by the railways which are operating motor coach service in connection with their train service were described by the officers in charge of the motor coach operations of three eastern roads at the November 16, 1928, meeting of the New York Railroad Club at New York. The benefits, as described by the three speakers, involved savings in operating expenses through reductions in passenger train service, net income from the motor coach operations themselves, and protection of the railways interests in the future. The experiences of the Boston & Maine were told by R. J. Littlefield, manager, motor coach service of the Boston & Maine Transportation Company. Those of the New York, New Haven & Hartford were described by F. S. Hobbs, general manager of the New England Transportation Company, and those of the Reading by E. D. Osterhout, passenger traffic manager of the Reading Company.

Below are presented abstracts of the address.

On the Boston & Maine

By R. J. Littlefield

Manager of Motor Coach Service, Boston & Maine Transportation Company

While there were a few thousand motor coaches in this country in 1922, the real development in this indus-

try has taken place during the last five years. What has happened to passenger travel on the railroads during this period? In 1923, Class I railroads of the United States carried 987,000,000 passengers, and in 1927, 829,000,000, a decrease of 16 per cent. Passenger revenues in 1923 were \$1,145,698,579 and in 1927, \$975,000,000, a decrease of 15 per cent. These figures include revenue received from the Pullman surcharge. With passenger traffic and revenues declining, what change has been made in the passenger service? In 1923, Class I roads operated 566,000,000 passenger train miles, and in 1927, 539,000,000, or a decrease of about five per cent. In other words, with a 16 per cent drop in traffic, and a 15 per cent drop in revenue, there was but a five per cent reduction in service.

Perhaps the Boston & Maine is in a better position to reduce passenger service than many roads because of its large number of branch lines of thin traffic and the fact that the motor coach service is well established. The average reduction in passenger train miles on Class I roads during the past five years was about five per cent. On the Boston & Maine, it was 16 per cent. A small part of the reduction on the B. & M. was due to the abandonment of 110 miles of road and the leasing of some short lines to other interests.

If it had been possible to reduce passenger service commensurately with the drop in passenger business

since January 1, 1923, the Class I roads would have cut their annual so-called "out-of-pocket" costs approximately \$116,000,000. It is, of course, recognized that the roads are victims of a vicious circle. Reducing service does drive away some business. It is hopeless ever to expect to reduce passenger service in the same ratio as the decline in business, so long as people continue leaving the rails for other forms of transportation.

Now, let us look at what development has taken place in the motor coach field during this period. There were a few thousand motor coaches in this country in 1922; but on January 1, 1928, there were 85,600; and it is estimated there will be 100,000 by January 1, 1929. These motor coaches, in 1927, operated over routes having a total route mileage of 635,609, or more than twice the miles of steam railroad in operation.

At first thought, the railroad man says that most of these 85,000 motor coaches were in city work replacing street railway service, but statistics show that only 8,492, or 10 per cent, were used by street railway companies. The remaining 90 per cent were divided as follows: Thirty-five thousand motor coaches, or 40 per cent, were common carriers on intertown, intercity or interstate routes; 35,000, or 40 per cent, were used in school work; 7,000, or nine per cent, were used in sight-seeing and miscellaneous work; and 994, or slightly over one per cent, were used by steam railroads or their subsidiaries.

One-third of the railroad-owned coaches in this country are operated in New England by the New England Transportation Company and the Boston & Maine Transportation Company. The New England railroads handle nine per cent of the passenger rail business of the country, but 33 per cent of the railroad-owned or operated motor coaches of the United States are in the six New England states.

Reasons for Rapid Growth

Several factors have brought about this rapid growth of the motor coach business:

1. Improved highways.
2. The fact that many people have more time than money.
3. A vehicle which can be operated at a cost of 30 cents per mile, or less, thus permitting rates considerably less than rail fares.
4. A vehicle which has many of the features of the automobile.
5. A vehicle which, because of its flexibility, provides a service often impossible by rail.
6. The desire of the people to ride on rubber.
7. A service free from dust and cinders.
8. A service which permits a better view of the countryside.
9. More comfort. In a few years motor coach manufacturers and operators through the development of shock absorbers and balloon tires, have developed a unit which is more comfortable than day coaches on the average railroad train.
10. A unit which provides in many cases a service more direct because highways are often more direct than rail lines.
11. A unit which provides service from door to door or from center to center.
12. A unit which, because of low operating costs, may be utilized to replace steam trains handling light traffic and still give a more frequent service.
13. A unit well adapted for use as a feeder to rail lines and to handle local traffic, thereby permitting passenger train schedules to be improved.
14. A unit particularly well adapted for special party or chartered work.

More reasons supporting motor coach service could be added to this list but these are the outstanding ones taken from observations of actual operations of motor coaches by the Boston & Maine for the last three and one-half years.

Motor coaches have been used to a considerable extent in New England in what might be called a service of protecting railroad revenues or protection from invasion of independent operators. Several interstate

lines have been purchased. These sales carry no certificates or permits and other independents could have entered the field in competition with the transportation company. But in most cases, by giving adequate service and controlling the terminals, the routes were pretty much under the full control of the transportation company.

Meeting Interstate Competition

An independent operator started in interstate service between two points about sixty miles apart in 1924. Rates were much lower than rail fares, in some cases 50 per cent lower. Revenue was approximately \$200,000 per year, and the first price set by the independent operator on this line, with equipment consisting of five coaches, was \$500,000. This, of course, was unreasonable, and an interstate service matching the schedules and rates of the independent was established by the transportation company. At first, the losses were heavy, \$3,000 to \$4,000 per month, but gradually the Boston & Maine service pulled business away from the independent and the line was finally purchased after a very extended series of negotiations, with five motor coaches, for \$25,000.

The most important part of this transaction was that after controlling and operating the route for one year, the rates were increased to a point where they were 75 per cent of the full fare rail ticket. This increase was accomplished without a protest from the patrons, and good equipment and dependable service were largely responsible for this situation. The protection to the rail line is worth much more than the purchase price of this route. Had this independent been allowed to continue until the present time, the purchase price would have been much higher.

This is but one example of the way in which motor coaches have been used to protect rail lines. By keeping everlastingly on the jump, the B. & M. has secured control of the motor coach business in its territory, and today there is real competition on only one route. This is the route between Boston and Portland, Me., and between these two points the transportation company has operated highway service since July, 1925, except for short periods during the first two winters. Other companies operate between these points, but the B. & M. provides 40 per cent of the service and carries an average of 60 per cent of the business. Last summer the B. & M. coaches carried an average of 2,000 passengers per week over this route which is 110 miles in length.

Motor Coach Tourist Business

Still another phase of motor coach activity is the tourist business. For four summers a profitable line has been operated interstate, Boston to the White mountains, 200 miles, at a fare somewhat higher than the rail fare. While this route is in operation only a few weeks, it is fairly well patronized and shows a profit at the end of the season. The B. & M. last summer offered a series of all-expense tours to some of the scenic spots in Maine, New Hampshire and Vermont. It was surprising to find how many combinations could be worked out by using rail service, regular motor coach service and one special tour service. There were some disappointments, inasmuch as the public showed a decided preference for the tours which offered 100 per cent highway service. Some new business was brought to the rail lines and more to the regular motor coach line serving the mountains and other vacation regions. Many people would have traveled with sightseeing companies, except for the

fact that the B. & M. was ready to make hotel reservations and look after all details and expenses in connection with a tour.

This adventure required very extensive advertising and on this account showed a loss. The B. & M. is satisfied, however, that the foundation has been laid for a much larger all-expense tour business over the highways next year. With the B. & M. rails serving the White mountains, the Lake Winnepesaukee region of New Hampshire and many other popular resorts, there is no good reason why the same company should not benefit by providing highway service to these points. One feature of the all-expense service which was popular was the fact that two men accompanied these tours—one as a driver and the other as conductor, the latter to explain points of interest, look after baggage and other details.

The motor coach is well adapted for special parties or chartered work. This field is large, particularly where there are athletic clubs, glee clubs and other parties available. Such movements are of a special nature that the train service many times does not accommodate. During the month of August, the special party work alone brought a revenue to the Boston & Maine of \$14,000. There is a good profit in this kind of work, the average charge being 50 cents per mile. Where competition is keen, however, it is necessary to reduce this rate somewhat.

How Motor Coaches Are Used

After nearly four years of motor coach operation, the Boston & Maine finds many ways that the motor coach can be used in the general scheme of transportation. It is a unit which rounds out the general program. The B. & M. has 32 routes operating over 1,300 route miles. These routes may be classified as follows:

1. Replacing railroad-owned electric service.
2. Replacing branch line trains.
3. Partially replacing main line trains.
4. Supplementing main line trains.
5. Replacing electric service not owned by the railroad.
6. Handling local traffic between the larger stations to permit the speeding up of trains.
7. Feeder service.
8. Special party and tourist service.

Motor coaches have replaced 200,000 passenger train miles or rail-car miles in the Boston & Maine territory. This has taken from the railroad expense sheet more than \$250,000 a year. On the other hand, the motor coach operation has been almost self-supporting. In 1926, there was a deficit of \$22,000. In 1927, with a revenue from motor coach operations amounting to \$505,000 and a motor coach mileage of 1,719,000, there was a profit of \$1,000. In 1928, the motor coach mileage operated by the Boston & Maine will be approximately 2,500,000, with a revenue of approximately \$750,000. Owing to a larger outlay for maintenance, particularly painting, and the taking over of unprofitable mail service, we expect a deficit at the end of the year of around \$30,000.

In some localities there is still opposition to motor coach transportation, primarily because of a fear that the rail line will be discontinued. Communities which opposed the establishing of highway service in 1925 are now asking for it. One interesting case came to the attention of the passenger traffic department a few days ago. While the Stony Brook line was being double-tracked, emergency motor coach service was established, replacing some of the local trains to give construction gangs and work train crews less interference from rail traffic. When the job was completed, local trains were restored and motor coach service discontinued. Now the principal communities on this

route have asked for the restoration of the highway transportation as it served the centers and received and discharged passengers nearer their homes.

During the summer of 1928, the Boston & Maine operated 112 coaches and gave service to 155 cities and towns in Maine, New Hampshire, Vermont, Massachusetts and New York. Here is a wonderful opportunity, which is not being lost sight of, by selecting proper drivers, carefully supervised, furnishing dependable service, with good equipment, to create a tremendous amount of good will towards highway service. Who is better equipped to operate this new service than the railroad company? With their organization, many years of experience in transportation, and opportunities to co-ordinate railway and highway service, the railroads should thereby provide a more complete system of transportation. The longer the delay, the more difficult the problem.

On the New Haven

By F. S. Hobbs

General Manager, New England Transportation Company

Our company was organized on June 15, 1925, which, as I remember it, was the very day that the laws were passed in Massachusetts which permitted the steam railroads to operate motor coach service. On August 10 of that year, we replaced the branch line between Branchville and Ridgefield with highway service.

From that day up to December 31, 1925, we had made the necessary surveys of the highway routes which we thought ought to be covered, and we finally covered 13 routes, involving the use of 48 coaches. One year from that date, or on December 31, 1926, 37 highway routes were in operation, involving 1,200 route miles and utilizing 197 motor coaches. On December 31, 1927, our operation included 45 routes, 1,874.6 route miles, involving the use of 240 motor coaches. On October 15, 1928, we were covering 58 routes, involving 2,152 route miles, and utilizing 270 coaches. This service for some time back has been running about 26,600 miles a day. Our payroll has been amounting to \$15,000 a week, with 504 employees on four operating divisions, one in Massachusetts, one in New York, one in Rhode Island and one in Connecticut. Our estimate of this year's (1928) business, made this week, is 5,340,500 passengers, covering a coach mileage of 9,022,000.

While I do not have the exact figures of what that means to the New Haven railroad, about 335,000 steam train miles have been eliminated on account of the substitution of this service. Some rail motor car mileage has been eliminated, and also some electric train mileage. This reduced mileage alone more than warrants the cost of this service. The rail routes that we operate involve a deficit of about \$120,000 a year to our company, which, of course, we earn and make up on other routes, in addition to which we expect a very substantial net.

Our lines are practically all certificated, except part of our Boston-New York route in New York state, so that the value of our franchise at this time and particularly in the future will run into many millions of dollars of real value.

The New Haven, through its subsidiaries, the New England Transportation Company, the Connecticut Company, the Worcester Consolidated Street Railway, the Springfield Street Railway and the County Transportation Company, is now using 560 motor coaches, divided up as follows: New England, 270; Connecticut, 130; Worcester Consolidated, 60; Springfield Street, Railway, 40; and the County Transportation Company, 60. This would indicate to me that they are running

about 20,000,000 coach miles a year, with a probability of carrying over 10,000,000 people. So one can see the magnitude of our operation in this motor coach service on the highways. We operate through Massachusetts, Rhode Island, Connecticut and New York, over an area of 55,000 sq. mi., covering 58 routes.

I am inclined to think that many railroad men are not in touch with what is actually going on on the highways in the handling of passengers and freight. This morning two coaches were dispatched from the Waldorf-Astoria for Cleveland and beyond, with 44 passengers. At noon the Los Angeles coach left with 18 people. It transfers its passengers at Pittsburgh, and I assume that they transfer again at Chicago. There is a motor coach service between Chicago and Detroit, with 21 round trips a day, and the business is averaging about 700 passengers a day. Chicago and St. Louis have the same service.

Unless some action is taken immediately, this business

are considerably longer. Naturally, this 16 mile haul in a thickly populated section of the country, with the towns close together, represented an ideal target for highway competition. As a short haul railroad, we felt the effect of the automobile and motor coach sooner than longer haul railroads.

Aside from a few routes which we had operated in the names of individuals for a short time, our first route was started last April. Our reason for starting motor coach operation was that we wanted to take off lightly patronized trains in territory where we felt that we could not make further reductions in train service and still maintain our prestige in the area we had served for upwards of a hundred years. The trains were not paying, they were not patronized, but we did not want to take them off because in most cases, on account of the branch line situation, the only way that we could save money was to take off a crew, and in taking off a crew we had to take off all or most of the train serv-



A New England Motor Coach in Service in Massachusetts

will make further inroads into the net of the carriers in both freight and passenger business.

If legislation should be enacted whereby motor coach routes, particularly interstate routes, would come under the jurisdiction of the Interstate Commerce Commission, many of them would be worth at least \$1,000,000. We have many routes in New England that are worth \$1,000,000, or more. This would mean that if the railways want to get the business in the future, they will have to pay dearly for it. In many cases these certificated routes pay at least 10 per cent on their appraised value.

On the Reading

By E. D. Osterhout,

Passenger Traffic Manager, Reading Company

The Reading Company is a fabric of railroads made up of many branch lines. Most of our mileage is in short branch lines. As a railroad, we are a short road, that is, we have a short haul. In 1927, our average haul per passenger was only 16 miles. Some other roads have about the same average haul, but most

ice, which would have left the community with little or no service. The principal inducement that led us to go into motor coach operation was the cheapness of such operation, somewhere between 25 and 30 cents a mile, including everything, as against somewhere between \$1 and \$1.25 a quarter of a mile, out-of-pocket expense, for passenger train operation.

We live up to our original policy of train substitution pretty thoroughly. We have purchased a few highway lines which paralleled us, and we have also taken over a few lines which act as feeders for the railroad and permit us to extend our service by co-ordinated train and motor coach in territory in which we previously served to some extent by rail alone.

We are young and have spent a good deal of money in development. We have not as yet gone through a winter, but our figures so far show that we have made a little money in the Reading Transportation Company, after paying all expenses. Aside from that, we have succeeded in saving the railroad about \$250,000 a year, and have taken off about 350,000 miles of unprofitable passenger train service a year, which we feel we could

not have done without great opposition if we had not substituted the motor coach service.

We are not through by any means. We have other plans. It may become our policy to expand into other lines, so far as the motor coach is concerned. We are in an unusual position, being located in Philadelphia which is on the border line of New Jersey, and we have had the worst possible competition from independent motor coach operators. We are proud of our railroad between Philadelphia and Atlantic City. We have spent a lot of money on it, and we think that we have just about the finest railroad that can be maintained. But one of the most popular highways in the world, the White Horse Pike, runs so close beside us that one could almost jump from the train to the highway for most of the distance between Philadelphia and Atlantic City. A few years ago the Delaware River bridge was opened. That brought the White Horse Pike right into the heart of Philadelphia. In one day last year, one independent operator carried 200 motor coach loads between Philadelphia and Atlantic City. With an average of 25 or 30 passengers per load, the competition is rather formidable. We have not yet met the Philadelphia-Atlantic City competition with motor coach operation, but we have it pretty well covered in Pennsylvania.

We advised the railroad commission, after lengthy study, that we proposed to supplement the rail service with motor coach service; and, also, that our motor coaches would be stopped only at the railroad stations or at the nearest highway point, and would not compete with the local operator who stopped at the street corners nor with the local trolley car systems which stopped at street corners. We were very bitterly opposed, the local traction and local motor coach companies of Pennsylvania actually keeping us out of motor coach operation for a long time. We are very fortunate in the establishment of a precedent in Pennsylvania by which, in spite of the presence of a local operator making stops at street corners on a highway paralleling our road, we also have the privilege of operating on that same road between the same points, provided we give the same general character of service as by train, stopping only at railroad stations where they happen to be on the highway, or at contiguous points. So we are very well satisfied with the progress we have made. We have saved a lot of money for the railroad and the transportation company has kept its head above water. We have made a little money.

Effect on Passenger Traffic

In some cases we are carrying more passengers in a day than we formerly carried in a week with the train service that we have taken off. In other cases the situation is not so favorable, and we are carrying about the same or a less number of passengers by motor coach than we carried by train. In those cases we shall eventually take the motor coach service off also, because we have demonstrated to ourselves and expect to be able to demonstrate to the commission and the public that common carrier transportation is not necessary.

Our organization is somewhat different from those explained before. We have a separate company, the Reading Transportation Company, and aside from direct operating matters, it is conducted by Reading officers. The controller of the railroad is the controller of the transportation company, and so on down the line, except that the operating department of the railroad has nothing to do with that of the motor coach line. That is a separate organization. We try to be very fair

about our expenses. Everything that is directly assignable to the transportation company is so charged. There are a number of items that might be questioned, but I think we have charged to the highway operation everything that should be charged to it.

The railroad does not make a charge to the transportation company for the joint use of facilities. Wherever possible, we use the railroad stations, and the ticket agent sells railroad and motor coach tickets. We do no parking on the public highway wherever it is possible to avoid it, but use parking space around our stations.

Operating Methods

The operation is divided into divisions similar to those in railroad operation. Each division is divided into the various branches with a supervisor in charge.



A Motor Coach in Service of the Reading Transportation Company

Sometimes on a large division he is a Reading Transportation employee, and in other cases a railroad employee. If he is a ticket agent for a small branch line, he is on the transportation company payroll for a small amount. His job is just about the same as that of a passenger trainmaster. It is his duty to see that the schedules are maintained, that the operators are there in uniform, and that the coaches are clean. We have made a very particular point of the upkeep of our equipment. We are very careful about keeping it clean. Our drivers have to go through a most severe test. Their physical fitness must be that of a locomotive engineer, and, in addition they must measure up in mental ability.

In cases of train substitution lines, the driver must operate the coach, and, in addition to the duties of an ordinary motor coach operator, such as collecting cash in 5 and 10 cent denominations, he must collect uneven amounts because of the railroad fare. He must know all about railroad tickets, because they are interchangeable. He must know about foreign as well as local tickets, and commutation fares. We are proud of the fact that we have been successful so far in getting good men.

We try to take railroad men if we can, although not many such employees seek places as drivers because our first requirement is that a man must be a qualified heavy-vehicle (coach and truck) driver in the territory to which he is assigned. Manifestly a railroad employee has not had that experience. All things being equal, we give preference to a relative, a son or nephew, of a railroad man, and we have several of that type of men in our service.

Baltimore & Ohio Opens New Motor Coach Terminal

Modern facilities provided for its New York patrons availing themselves of train side motor coach service

THE Baltimore & Ohio, on December 17, 1928, opened a new and modern motor coach terminal on the ground floor of the new 56-story Chanin building which is located directly opposite the Grand Central Terminal at the corner of Forty-second street and Lexington avenue, New York. The new facilities will serve Baltimore & Ohio patrons who avail themselves of the train side motor coach service which the road provides from Manhattan to the Jersey City terminal of the Central of New Jersey where the New York runs of the Baltimore & Ohio passenger trains have terminated, since the discontinuance of the B. & O.'s direct rail service to Manhattan over the lines of the Pennsylvania.

This train side service was inaugurated in April, 1926, following the termination of the contract which had provided for the entrance of the B. & O. trains into Penn-



Main Concourse Looking from Forty-second Street Side

Twenty-third street. The train side motor coach service was determined upon and a terminal was established in the Pershing Square building, located a few doors east of the Chanin building which houses the new station.

With the recent opening of the latter, the Pershing Square station has been discontinued while the coaches

sylvania station. The termination of this contract with the Pennsylvania necessitated the seeking of other terminal facilities by the Baltimore & Ohio, and it consequently had recourse to the Central of New Jersey terminal which was the B. & O. terminal prior to the war.

During its tenancy of the Pennsylvania station, however, the B. & O. had built up a clientele in the midtown section of New York which it desired to continue serving. To do so meant the provision of other facilities in addition to the Central of New Jersey ferries at Liberty street and



Exterior View of Terminal from Forty-second Street



Motor Coach Entrance on Forty-first Street

continue to serve the Waldorf-Astoria station on Thirty-third street, west of Fifth avenue, and the Joralemon street station in Brooklyn.

Station Was Part of Building Plan

That section of the Chanin building which houses the motor coach station was designed especially for that purpose. The B. & O. occupancy was anticipated before the building was erected and thus the layout of the terminal was incorporated into the construction plan. The architects were Sloan & Robertson, New York, designers of the Chanin building. They planned and executed the motor coach station in collaboration with H. A. Lane, chief engineer, and L. P. Kimball, engineer of buildings, of the B. & O.

The frontage of the terminal on Forty-second street affords two large show windows in which are displayed a model of a modern B. & O. locomotive and another of the pioneer locomotive "Tom Thumb." Views of the scenery along the B. & O. lines are also exhibited together with other display advertising material.

The main entrance from Forty-second street leads into the lobby where the passenger purchases his ticket at the ticket counter on the right while his luggage is taken and checked directly to his seat on the

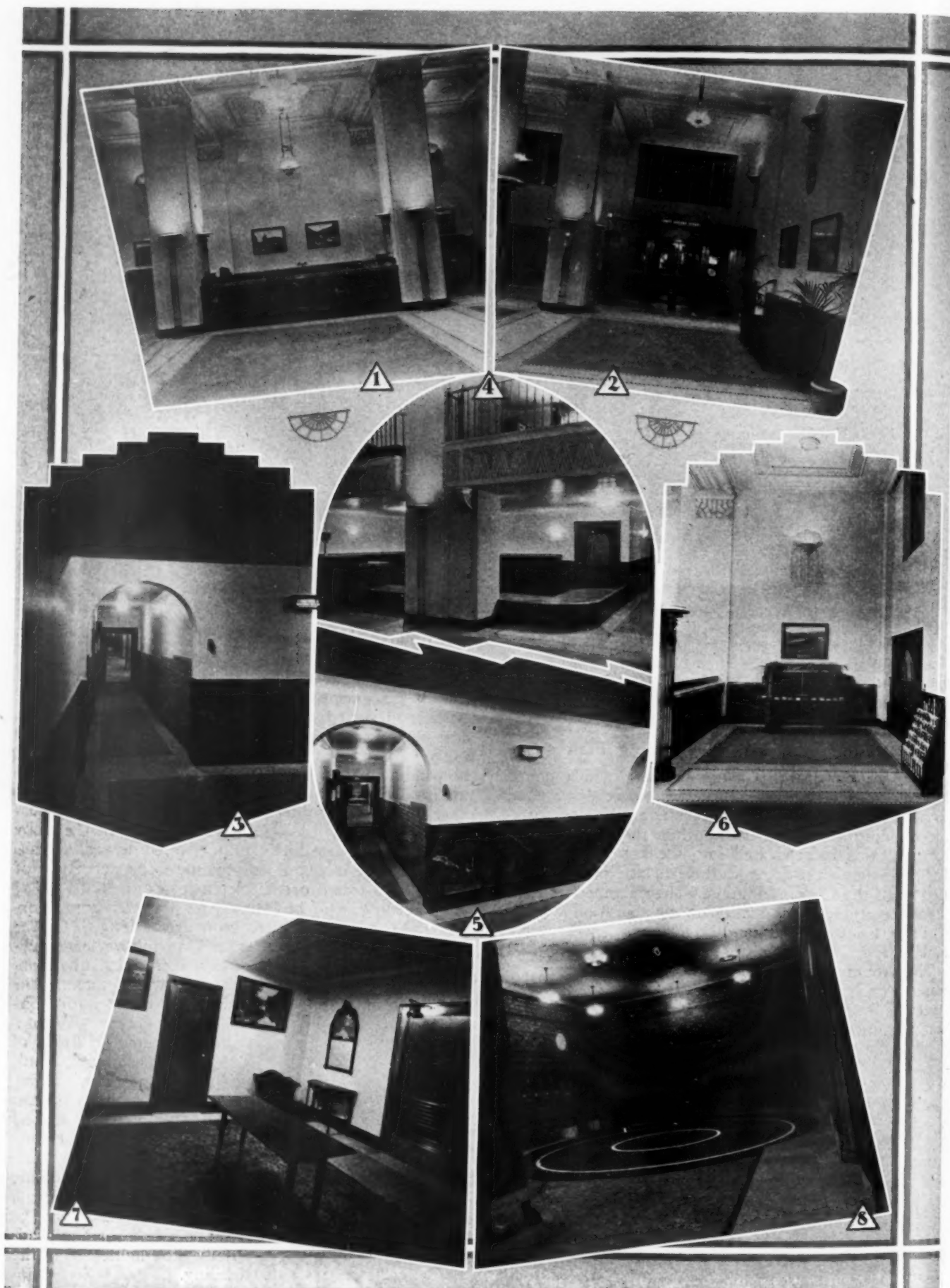
train which he intends to board at Jersey City. The lobby is spacious, while its facilities and fixtures are artistically designed and arranged to harmonize into a most pleasing setting which nicely combines luxury and utility. Alongside the ticket counter and directly behind the window display is an attractively arranged literature rack and table for the distribution of time tables and other informative folders issued in connection with passenger traffic activities. Other furnishings of the lobby and main concourse include upholstered divans, a flashing light wall indicator to announce the departure of coaches and sound proof telephone booths.

The ceiling is of buff tinted plaster with panel borders and rosettes in modern geometrical design. On the walls, to relieve large surfaces, there is adequate ornament, which includes in its composition wall sconces for lighting. With a floor executed in fields of black terrazzo with bands of yellow and gray, a wainscot of warm red marble, walls of a light natural stone color and a ceiling kept light by low reliefs, there is achieved a pleasing gradation of color, starting with the darkest value at the floor and shading gradually to lightest in the ceiling.

This color scheme is greatly enhanced by the lighting of the room. Chromium plated bronze



View of General Passenger Agent's Office on Balcony Overlooking Lobby

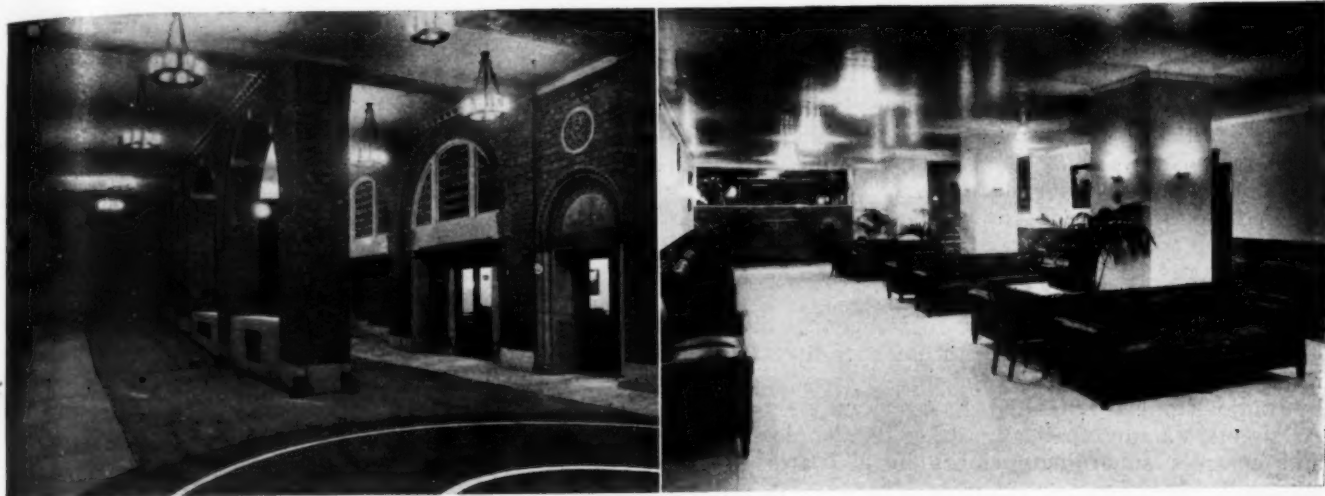


- | | | |
|---------------------------------|--|--------------------------|
| 1. Ticket Counter | 4. Baggage Counter | 6. Literature Rack |
| 2. Forty-second Street Entrance | 5. Passage Between Main Concourse and Waiting Room | 7. Ladies' Rest Room |
| 3. Passageway to Driveway | | 8. Motor Coach Turntable |

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The Driveways Are Situated Alongside the Waiting Room

standards of vertical line open work design are placed at each of the four sides of Caen stone columns, supporting indirect lighting fixtures reminiscent of ancient incense-burning braziers. From these tall fixtures the light issues at a point above the normal eye level and is thrown up to the ceiling, which in turn diffuses and reflects the light down to the floor, giving a daylighting effect. A large bronze and glass fixture at the center of the ceiling, with four smaller fixtures of similar design placed in alternate ceiling panels, completes the lighting arrangement.

Passageway to Grand Central

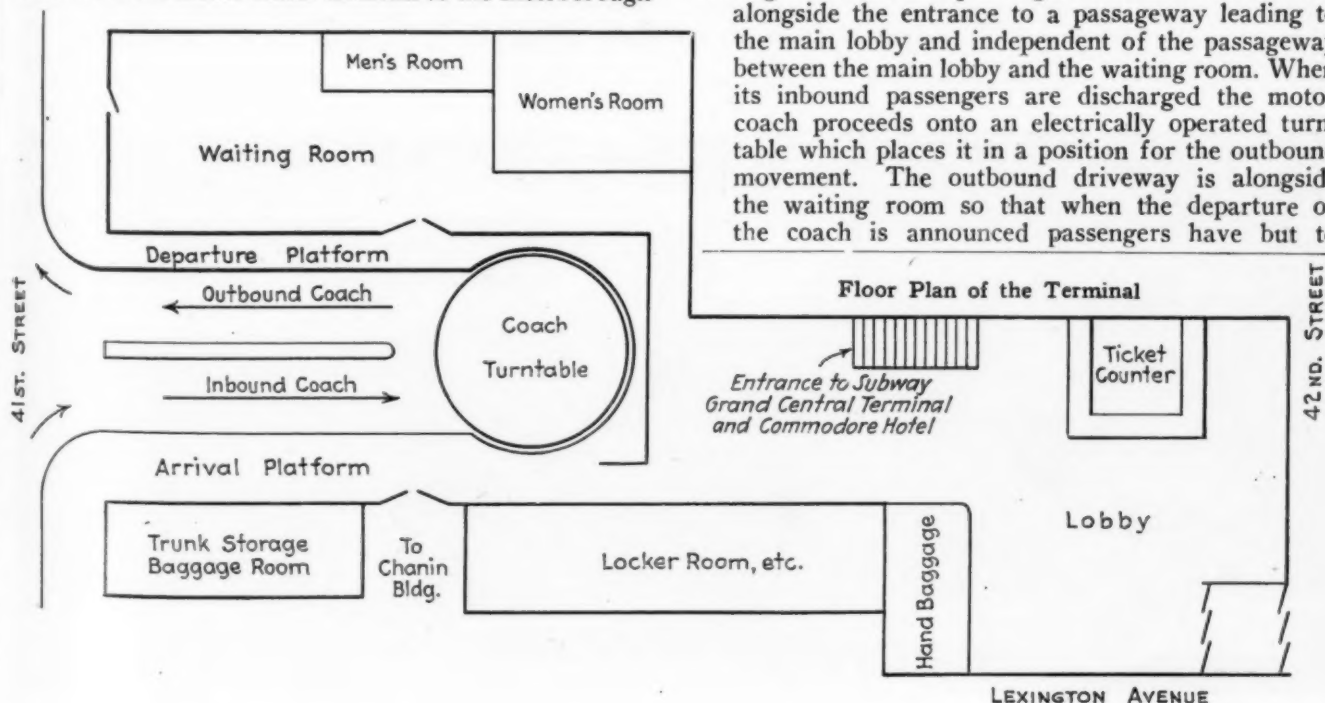
In the back of the lobby is one stairway which leads to the passageway under Forty-second street to Grand Central terminal and another which leads to the New York offices of the B. & O. passenger traffic department which are conveniently located on a balcony overlooking the lobby. The passageway under the street to Grand Central Terminal, of course, facilitates the transfer of passengers between the B. & O. and the lines entering that station while it also affords a convenient route from the motor coach terminal to the Interborough

subway lines and the Commodore and Roosevelt hotels.

The waiting room is located behind the lobby and is reached through a corridor. This waiting room resembles a hotel lobby or club lounging room. It is elaborately fitted with upholstered furnishings while it is rendered still more appealing by attractive decorations. Adjacent to it are the toilet facilities and the ladies' rest room. The waiting room is also located alongside the driveway by which the motor coaches enter the building from Forty-first street. This entrance of the coaches into the building is regarded by B. & O. officers as a most important forward step in the interest of efficient and expedited operation, since all street traffic congestion and interference with free loading and unloading is avoided. It also affords greater comfort and convenience to the patrons, especially in times of disagreeable weather.

Driveways Into Station

Two separate driveways are provided into the building from Forty-first street, one being for the arriving coaches and the other for those departing. The coaches arriving with inbound passengers for New York drive alongside the entrance to a passageway leading to the main lobby and independent of the passageway between the main lobby and the waiting room. When its inbound passengers are discharged the motor coach proceeds onto an electrically operated turntable which places it in a position for the outbound movement. The outbound driveway is alongside the waiting room so that when the departure of the coach is announced passengers have but to



step from the waiting room through a convenient doorway and into the coach which is drawn up to this exit for loading.

The balcony overlooking the main lobby provides offices for the B. & O. traffic officers who have headquarters at New York. The large office on the balcony proper is that of the general passenger agent. This outer office is surrounded by private offices of the general passenger agent, the general eastern passenger agent and the conference room for passenger traffic officers' meetings.

A novel feature of the office furnishings is the radio clock which is said to be the first installed by a railroad in this country. It receives the correct time twice daily by radio from the United States Radio Station at Arlington, Va., automatically makes its own corrections and controls subordinate clocks in all parts of the station.

Pennsylvania Announces Motor Coach Plans

EXTENSIVE motor coach operations, designed to co-ordinate with its rail passenger service throughout the territory which its lines now serve, were announced by the Pennsylvania in a statement issued on January 21. As a preliminary step, in this comprehensive plan for operations on the highway, the statement says that the Pennsylvania "has acquired a substantial interest in three motor coach companies operating lines radiating from Philadelphia, Pa., and its vicinity and heretofore owned by the Philadelphia Rapid Transit Company."

The companies in which the interest has been acquired are: The Peoples Rapid Transit Company, Inc., which operates 76 motor coaches between Philadelphia and New York, Philadelphia and Atlantic City, N. J., Philadelphia, Wilmington, Del., Baltimore, Md., and Washington, D. C., and special excursions to Valley Forge, Pa., Buffalo and West Point, N. Y., and other points of interest; the Montgomery Bus Company, operating 17 motor coaches in services out of Philadelphia, and the Philadelphia Suburban Transit Company, Inc., which operates 13 motor coaches between Philadelphia and Bryn Mawr and Ardmore, Pa.

The announcement states that the co-ordinated service will be established progressively where need exists or arises either in the public interest or to encourage the continued development of the company's general passenger traffic. It continues to say that the acquisition of shares in the three lines, mentioned in the foregoing, and the establishment of working relations with them, follows the incorporation last September of the Pennsylvania's highway subsidiary, the Pennsylvania General Transit Company, which now has applications for certificates of public convenience in various counties of Pennsylvania pending before the Public Service Commission of that commonwealth.

The general plan which the road contemplates placing progressively into execution is summarized in the statement as follows:

When arrangements are completed under this broad plan, passengers over specified routes may be offered the option of making their journeys partly by rail and partly by motor coach, using sleeping cars at night and motor coaches for all or part of the daylight hours of the trip. This will extend to joint rail and motor coach travel the same principle which is contemplated in the joint rail and air transcontinental service to be established by the Pennsylvania and other interests during the coming spring.

Other features will eventually include the sale, over certain routes, of through tickets covering joint rail and motor coach journeys; the operation of motor coaches to perform the functions of local train service over selected stretches of main or important rail lines, where this is advisable in order to speed up the operation of through trains; also the use of motor coaches, where conditions warrant, to take the place entirely of passenger train service on branch lines of light traffic.

In addition, it is intended to utilize motor coach lines more effectively than heretofore as feeders for the rail service, and also to extend or improve motor coach transportation service in territory not conveniently served by railroad facilities.

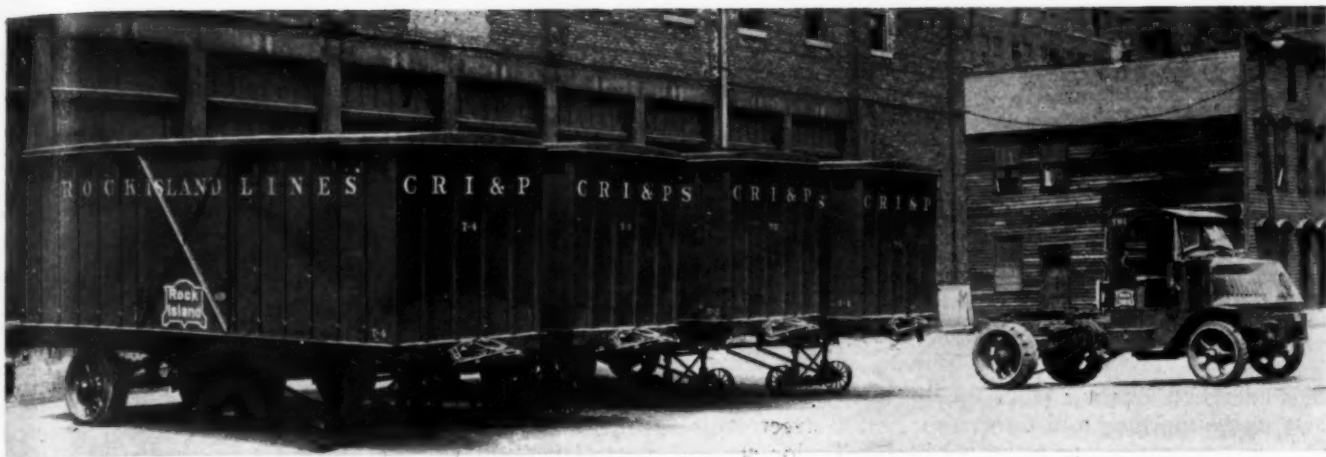
The carrying out of the general plan will involve, in some cases, the inauguration of new motor coach lines and in other instances establishment of working arrangements with lines already existing, together with acquisition of a financial interest in them.

In lending its endorsement and support to passenger motor coach service on the public highways in this manner, and tying in such service with its own train operations, it will be the policy of the Pennsylvania management to assure the public that all motor coach operations with which it is associated shall be conducted upon the same standards as are identified with its train service. In this manner the Pennsylvania believes that the public will be able to enjoy a much higher and more reliable form of passenger motor coach service than has heretofore been possible.

* * * *



A Mack Five-ton Truck Used to Carry 1 c. 1 Freight on the Central Railroad of New Jersey



Motor Equipment at Taylor Street Station

Rock Island Finds Tractors and Trailers Valuable

Trap car replacement in Chicago district results in substantial economies and improvements in service

THE operation of tractors and trailers in replacement of trap car service between several of its freight stations in the Chicago district has enabled the Chicago, Rock Island & Pacific to reduce substantially the cost of providing this service and has also resulted in several other important advantages. Beginning the operation several years ago as an experiment, the Rock Island soon found that the success of the venture so far exceeded its expectations, that consideration has been given to the extension of the tractor and trailer service to other points in the Chicago district and also to the inauguration of similar service at other points on its lines.

The tractor and trailer service of the Rock Island was begun on August 2, 1925, with the intention of continuing it at least during a six-month trial period. After several experiments as to the number of highway units needed to carry on the service, it was found that one tractor and four semi-trailers would be adequate to meet the needs of the operation. Accordingly, a Mack 10-ton, chain-drive tractor and four 10-ton Trailmobile semi-trailers were secured. The semi-trailers are 22 ft. long, 8 ft. wide and 7 ft. high, having two solid rear end doors and two sliding side doors. The trailer bodies are all-steel and are similar to those used by the American Railway Express Company, except for the sliding side doors which render it possible to load the trailers in the same manner as box cars.

The tractor and trailer service was put into effect

between the inbound and outbound freighthouses at Taylor street, Chicago, the north end of the route, and the freighthouse at Blue Island, the south end. The service was also provided at the freight stations in Morgan Park, Gresham, Washington Heights and Englewood. The distance from Taylor street to Blue Island is 17.5 miles; from Taylor street to Morgan Park, 14.5 miles; from Taylor street to Washington Heights, 12.9 miles; from Taylor street to Gresham, 10.6 miles; and from Taylor street to Englewood, 7.1 miles.

Present Schedule

The tractor and trailer schedule operated at present is as follows: The tractor leaves Taylor street, Chicago, for Blue Island at 5 a.m. with a loaded trailer. It arrives at Blue Island at 6:30 a.m., sets the loaded trailer at the freighthouse and picks up another loaded trailer for Taylor street. Leaving Blue Island at 6:35 a.m., the tractor reaches Taylor street at 8:15 a.m. Here it picks up a loaded trailer for Englewood, leaving Taylor street at 8:35 a.m. and arriving at Englewood at 9:10 a.m. The tractor drops this trailer at Englewood and picks up another loaded trailer for Taylor street. Leaving Englewood at 9:25 a.m. it arrives at Taylor street at 10:30 a.m. The next run is to Blue Island, departure from Taylor street being at 10:35 a.m. On this schedule stops are made at all intermediate stations and shipments to those stations are unloaded. The tractor arrives at Blue Island on this schedule at 1:45 p.m. At

Poundage Handled by Tractor and Trailer

Month of	Connecting Line		Line Haul		Intracity		Total	
	1928	1927	1928	1927	1928	1927	1928	1927
October	844,690	696,660	569,226	519,199	82,602	54,271	1,683,484	1,526,322
November	599,253	690,599	398,213	525,439	32,978	34,434	1,172,309	1,468,528
December	505,443	485,672	435,292	510,901	47,566	29,687	1,164,283	1,204,288



The Trailers Have Side As Well As End Doors

Blue Island the tractor picks up the trailer it had left early in the morning and returns to Taylor street, stopping at local stations to pick freight for Taylor street. The tractor arrives at Taylor street at 4:30 p.m., with the trailer loaded from the various stations, and is unloaded in time for the shipments to be placed in cars scheduled for departure on evening trains.

Previous to the installation of the tractor and trailer service, when trap cars had been used, l.c.l. freight received at Burr Oak transfer near Blue Island and consigned to Chicago intracity stations was loaded into cars for Taylor street and rehandled at that point into cars moving to the intracity stations. The schedule of trap car operation previous to the installation of the tractor and trailer service was as follows: One car from Taylor street to Englewood daily; one car every second day from Taylor street to Gresham; one car every other day from Taylor street to Washington Heights; one car every second day from Taylor street to Morgan Park; one car every day from Blue Island to Taylor street; one car every fourth day from Englewood to Taylor street; one car every fourth day from Gresham to Taylor street; one car every three days from Washington Heights to Taylor street; and one car every three days from Morgan Park to Taylor street. By means of the tractor and trailer operation, giving daily service to all stations, 24 hours in time of transit is saved between Chicago and Englewood and Blue Island, and at least 48 hours in time of transit to and from Gresham, Washington Heights and Morgan Park.

Subsidiary Company Organized

In January, 1927, it was decided that the service had fully met all expectations. It was felt that, to continue to operate the tractor and trailer service, a separate company should be organized to carry it on. Consequently, the Rock Island Motor Transit Company was organized and a charter was secured from the secretary of state of Illinois. After some delay a certificate was also secured from the Illinois Commerce Commission,



Side View of Trailer

permitting the operation. This certificate was required since the operation extended slightly beyond the limits of Cook county. The charter secured by the Rock Island Motor Transit Company is broad in its provisions and carries with it the right to operate vehicles of any kind over the streets and highways, and for any purpose. By means of its subsidiary company, the Rock Island can eventually carry on motor coach operation if it wishes to do so. The charter of the subsidiary will permit this.

Substantial Traffic Carried

From the outset, the tractors and trailers of the Rock Island handled a substantial amount of l.c.l. freight traffic. Between July 23, 1926, and October 1, 1927, comprising 372 working days, a total of 18,013,590 lb. of l.c.l. freight was handled by tractor and trailer, or an average of 48,423 lb. per working day. For the year ending July 23, 1927, a total of 15,435,332 lb. of l.c.l. freight was handled in the trailers, as compared with a

total of 13,012,300 lb. of such freight handled to trap cars in the same months of the previous year. To handle the tonnage carried in the tractors and trailers in the year ending July 23, 1927, an average of 135 trap car movements per month would have been required.

For the year ending December 31, 1927, the tractors and trailers handled 5,841,147 lb. of l.c.l. freight southbound, and 7,901,563 lb. northbound, and 1,676,112 lb. was transferred by tractor and trailer from the inbound house to the outbound house at Taylor street. This makes a total of 15,418,022 lb. handled during 1927.

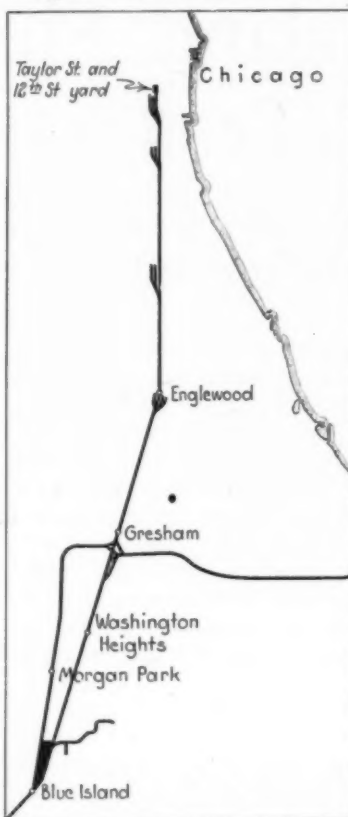
The total cost of operation of the tractors and trailers of the Rock Island Motor Transit Company, during the year 1927, was \$10,-

021.30. Of this total cost, \$6,610.76 was assigned to operation, including wages of the driver and helper, gasoline, oil, etc. The maintenance cost was \$1,275.65, and depreciation, interest and taxes amounted to \$2,134.89, making the total cost, as stated before, \$10,021.30.

Savings Effectuated

On the basis of the cost, all factors included, of handling this business by trap car, estimated at \$15,300, a saving of \$5,278.78 was effected by the tractor and trailer substitution. This saving represents 32.2 per cent of the investment in it.

During 1927, the tractor covered 25,239 miles. Gasoline consumption was at the rate of 3.24 miles per gal-

Rock Island Lines in Chicago
and Stations Served by Tractors
and Trailers

lon. During the year, depreciation was charged at the rate of 10 per cent and interest at 6 per cent.

The annual cost of operation during 1927 was \$1,916 less than the estimate of the cost which had been made. It is considered that the maintenance cost may have been unduly low, since the tractor and trailers were nearly new. The tractor was maintained during the year at the Mack service station and the trailers were given general overhaul by the Trailmobile Company.

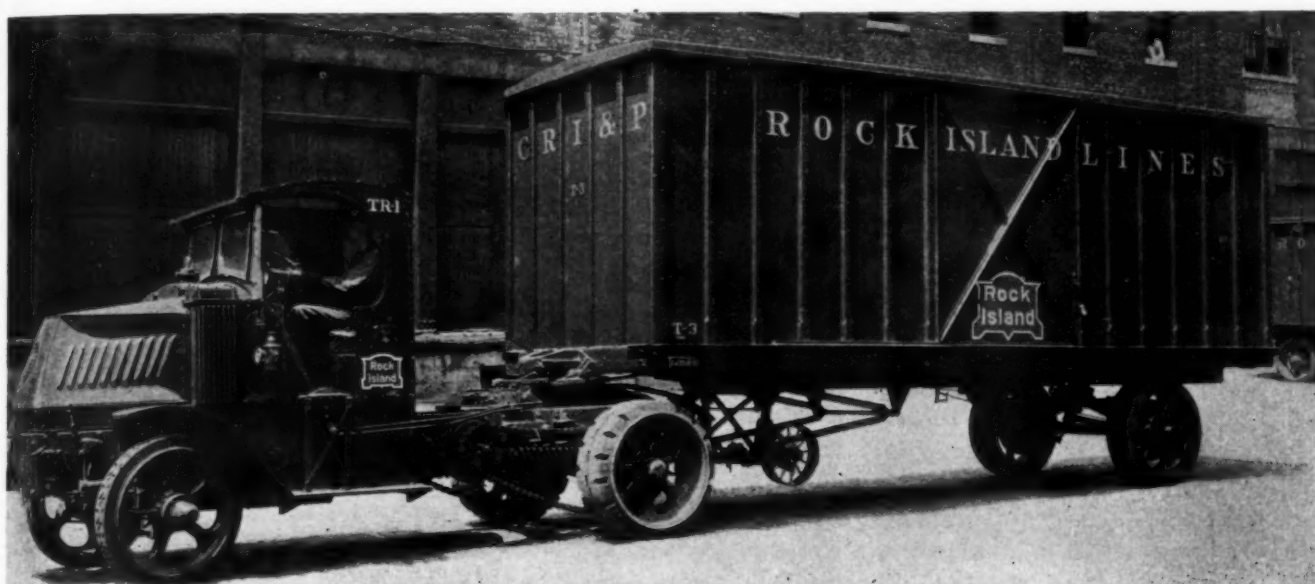
Business in 1928

The business handled by the tractor and trailers during the last three months of 1928 is shown in the accompanying table. Comparison is also made with the amount of freight handled in the same three months of 1927. This table shows that the total amount of l.c.l.

ber of trap cars were switched between stations in the Chicago-Blue Island territory. These had been received from connecting lines and could be moved more cheaply as trap cars than by rehandling their freight and loading it into trailers. Forty such cars were handled during the month of November, and 33 during December. During October, 1928, when there was a 10 per cent increase in business as compared with the same period in 1927, only six such trap cars were handled.

Advantages Summarized

On the basis of its experience of several years in tractor and trailer operation for the replacement of trap cars, the Rock Island believes that it has secured a number of advantages from the substitution. First, of course, has been the reduction in the cost of providing



Mack Tractor and Trailmobile Trailer Used by Rock Island at Chicago

freight handled by tractor and trailer, including connecting line, line haul and intra-city business, was 1,683,484 lb. in October, 1928, as compared to 1,526,322 lb. in October, 1927. In the month of November, 1928, a total of 1,172,309 lb. was handled, and in November, 1927, 1,468,528 lb. In December, 1928, a total of 1,164,283 lb. was handled by tractor and trailer, as compared to 1,204,288 lb. handled in December, 1927.

Traffic Would Require 189 Trap Cars

It is estimated by the Rock Island that 189 trap cars would have been required to handle the freight moved by tractor and trailer during October, 1928. Taking the poundage for October, 1928—1,163,980 lb.—as a basis, using the average net load in 1924 trap cars before the tractor and trailer operation began, and using the estimate of cost of handling trap cars, it is estimated that the trap car cost of handling the freight carried by tractor and trailers in October, 1928, would have been 10.4 cents per hundred pounds, or \$65.09 per day. The actual cost of handling this business by tractor and trailer was 6.5 cents per hundred pounds, or \$42.51 per day. This represents a saving of 3.9 cents per hundred pounds, or \$22.58 per day.

The reduction in the amount of freight handled in November and December, 1928, as compared with the same months in 1927, was due to the fact that a num-

ber of trap cars were switched between stations in the Chicago-Blue Island territory. These had been received from connecting lines and could be moved more cheaply as trap cars than by rehandling their freight and loading it into trailers.

The second advantage has been the release of car space for other use at the stations served by tractor and trailers. This space is particularly valuable at Taylor street freight house, which is in highly congested territory.

Another advantage of the tractor and trailer operation has been the release of freight cars formerly used in trap car service for other work from which greater revenues can be derived. Another advantage has been the elimination of from 24 to 48 hours delay in the movement of l.c.l. freight to and from the shippers along the Rock Island lines. The fifth advantage has been that business has increased as a result of the better service that the Rock Island is providing by tractors and trailers.

THE SECOND SLEEPER MOTOR COACH SERVICE IN GREAT BRITAIN was inaugurated on December 19 when the Express Motors, Ltd., of Darlington commenced operations between Newcastle-on-Tyne, Darlington and London. The first regular service of this kind in Great Britain has been in operation between London and Liverpool since August, 1928. The new route is 280 miles in length and the coach makes three journeys weekly in each direction. The vehicle is equipped with 12 bunks, each six feet long and two feet wide. Fares are less than third class railway fares for the same journey.

Burning Fuel Oil and Analyzing Exhaust Gas*

Horsepower output increased 15 per cent—Low carbon monoxide content of exhaust gas indicates high degree of combustion

By J. A. Queeney

Vice-president in Charge of Operation, Mitten Management, Inc., Philadelphia, Pa.

THE problem of operating a gas engine successfully with fuel oil, without the use of gasoline for starting, or without complicated undependable mechanism, has been considered by many engineers as one that could not be solved and by many others as extremely doubtful. Mitten Management, however, as operators of a large fleet of city motor coaches, is too greatly interested in the advantages of such operation to be convinced without a trial. After experiments dur-

was decided that we were on the wrong track and made a fresh start with renewed courage and confidence, as we had made some progress.

Godward Gas Generator

In January, 1927, investigation was made of the Godward gas generator, which consists of an aluminum pot in which is set a nest of stationary thin curved plates, radiating from a central core. The lower edges of the



A P.R.T. Motor Coach Equipped to Burn Fuel Oil

ing a period of two years, we now have 20 coaches operating so successfully with fuel oil that before the close of the year, I confidently expect that every one of our 580 coaches, in city and intercity service, will be operating on this principle.

First Experiments With Fuel Oil

About two years ago, a device was submitted by the inventor who claimed it would permit the substitution of fuel oil for gasoline. It was installed on one of our taxicabs. After numerous tests, it was found that while it was possible to operate on fuel oil, by starting this engine on gasoline, the general performance was so unsatisfactory that it could not be given serious consideration. For example, when good idling performance was obtained, it would be impossible to secure sufficient power output for satisfactory operation at the usual operating speeds, and when sufficient power output was obtained, the engine would not operate satisfactorily at the lower speeds, so, after many months of effort, it

plates are in contact with the aluminum pot, which is heated by the exhaust of the engine. The fuel is drawn from a standard carburetor through the inside of the pot over the surface of the warm plates, where it is converted into a dry gas and whence it passes through the intake manifold into the cylinders.

Observations made through a glass window, inserted in the intake manifold, showed that with gasoline and a standard carburetor and manifold under all running conditions, wet gasoline is carried into the engine cylinders, but with a Godward gas generator installed, no evidence could be found of a wet mixture in the manifold.

At present, 20 of our gas-electric motor coaches are equipped with this device, operating in intercity service where heavy grades are encountered. Since the installation, these vehicles have made over 300,000 miles. The device has enabled us to increase the horsepower output of the engines 15 per cent, which has resulted in a decided improvement in the performance of the vehicles, especially on hills, and has enabled us to increase the scheduled speed of intercity lines without

* Abstract of a paper presented January 17, 1929, before the Engineers' Club of Philadelphia, Pa.

any increase in gasoline consumption in pounds per brake horsepower per hour.

The device as designed for the use of fuel oil has incorporated in it an electrical heating unit, which is used during the starting period only. By means of this unit, the temperature of the fuel is raised sufficiently to start the engine. The heating unit receives its energy from the storage battery and draws 8 amperes at 12 volts for about one minute, which is the time required for starting the engine under present conditions and which is no greater than that required to start with gasoline. The principle of the Godward device used to operate with fuel oil, is identical with that of the device used for gasoline.

A Special Intake Manifold Is Used

In addition to the Godward device, we use a special intake manifold which has no sharp bends, pockets or hot spots, and has considerably greater cross-sectional area and consequently less restriction than the conventional manifold. A reduction in the intake manifold velocity is permissible because of the dry gas produced in the gas generator. This construction allows an increase in the quantity of the mixture entering the cylinders, thus increasing the volumetric efficiency of the engine.

No other special equipment is required. We use exactly the same carburetor as is supplied by the manufacturer with the engine. We can fill the tank of one of the motor coaches equipped with this device with fuel oil and send it out across the country and if no fuel oil is available when it reaches a point where it is necessary to replenish the supply, the tank may be filled with gasoline and without any adjustment, the unit will proceed and neither the driver nor the passengers will notice any difference, as there will be no perceptible change in the performance of the vehicle.

The fuel which we are now using is a 38-42 Baumé oil. The performance of the engine, operating on this fuel, compares favorably with the performance secured through the use of gasoline. Idling, speed, acceleration and power, all so essential to good operation, are attained through this device, with a fixed carburetor setting.

The economy in quarts per kilowatt-hour with fuel oil, is $5\frac{1}{2}$ per cent better than with gasoline, with the same carburetor setting. The economy effected, due to the difference in the cost of fuel oil and gasoline, is about 29 per cent.

A Few Questions Raised

The question has often been asked as to what effect the use of fuel oil has on the maintenance of the engine. We have given this matter close attention and after over 250,000 miles of operation, we can find nothing that indicates in any way any additional wear or any change whatsoever in the condition of the engine as the result of using fuel oil. These units are on the same maintenance schedule as those using gasoline.

The next question usually asked, concerns that of dilution. When using fuel oil, the dilution is no greater than when gasoline is used with standard equipment without the Godward device.

The third question often asked is that of exhaust smoke. Considerable trouble with smoke was experienced when fuel oil was first used, particularly when the engine was idling. This trouble was remedied by the simple expedient of removing the throttle valve from the conventional location in the carburetor below the

gas generator to a point where the mixture enters the intake manifold.

Analyzing Exhaust Gases

In addition to the apparatus used for the burning of fuel oil, we also have developed apparatus, which is now in daily use; first, as a check on engine efficiency, as any unburned gas that is present in the exhaust represents a definite power loss, and second, for analyzing the exhaust, so as to reduce to a minimum, the poisonous carbon monoxide gas.

Many people believe that because of the size of the motor coach, it is a great offender by filling the air with poisonous carbon monoxide gas. Recognizing the importance of reducing to a minimum the carbon monoxide gas, we have conducted many experiments and tests which have resulted in the production of the exhaust analyzing equipment.

Our studies prove conclusively that by maintaining the engine in good mechanical condition and by proper adjustment of the carburetor, the exhaust gas can be controlled.

A survey by engineers of the United States Bureau of Mines, disclosed that the percentage of carbon monoxide gas with the majority of cars lies between five and nine per cent. With this apparatus, we have no difficulty in decreasing the carbon monoxide content from the exhaust of our coaches to three per cent, or less. As low as one per cent has been obtained, under both idling and operating conditions, so that I feel justified in stating that in the development of the exhaust-gas analyzing apparatus, we have not only made a distinct contribution to the transportation industry, but have accomplished something decidedly in the interest of the health of our citizens.

Gasoline, such as we buy at any filling station, contains approximately 85 per cent carbon and 15 per cent hydrogen. During the burning process inside the engine, the gasoline is broken up into various combinations, the most common of which are carbon monoxide, carbon dioxide, hydrogen, methane and gasoline vapor. Of this group, the two most important are carbon monoxide and carbon dioxide. If combustion were perfect and complete, all the carbon monoxide would be burned to carbon dioxide, which is a harmless gas, but since this condition is never attained in the modern automobile, we have to deal with carbon monoxide.

From the foregoing, it is evident that an instrument, which accurately measures the carbon dioxide in the exhaust gas, is valuable as giving an indication of the performance of the engine.

Numerous tests have shown that a motor in good condition produces between 10 and 12 per cent carbon dioxide, and if, therefore, the engine under consideration, shows a much lower figure, it is evident that either the carburetor is poorly adjusted, the ignition is faulty or the compression is low, due to leaky valves or some other cause.

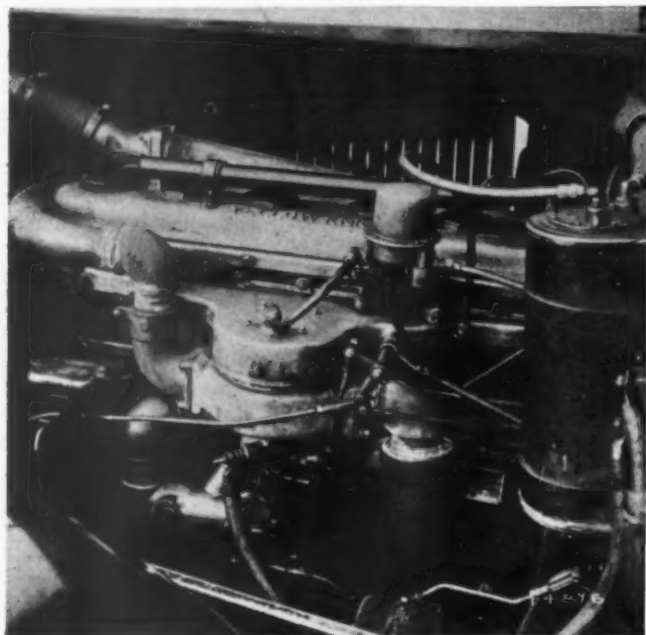
Apparatus for Analyzing Exhaust Gases

It is not practical to measure the carbon dioxide directly with an electric indicator, so an instrument has been developed which measures the carbon monoxide, hydrogen and other combustibles present in the exhaust. This instrument records the incompleteness of the combustion.

The apparatus consists of two small cylinders, each containing a wire of special composition. These wires are connected to a battery and a meter through suitable resistances. The meter is simply a moving coil galvan-

ometer. When the switch is turned on, connecting the batteries with the wires in the two cylinders, the meter will register zero, since both cylinders are filled with air and the entire electrical system is balanced. In operation, a connection is made between the exhaust manifold of the engine and the inlet pipe of the testing apparatus. As the exhaust gas enters one of the cylinders, it draws a small quantity of air through a nozzle. The resulting mixture being combustible, is ignited when it comes in contact with the heated wire. The burning of this gas still further raises the temperature of the wire so that its resistance is varied with the percentage of the combustibles contained in the gas.

This change of resistance of the wire in the cylinder throws the circuit out of electrical balance and causes a current to flow through the galvanometer, which is



Installation of the Godward Vaporizer for Burning Fuel Oil in Gasoline Engine

graduated to read directly in percentage of carbon monoxide, hydrogen and other combustibles present in the exhaust.

Definite standards are established, and if the meter reading is above or below these standards, the operator adjusts the carburetor or ignition, or makes other changes until the meter reading becomes normal.

It is evident that both the apparatus used for burning of fuel oil, and that developed for the analysis and control of the exhaust, are important contributions to the transportation industry, and because of this fact, we were not content with our own conclusions, but engaged the services of two engineering professors from a reputable engineering school.

Test Data

The engineers submitted the following report: "On December 15, 1928, we visited your Hunting Park avenue garage and noted the operation of P.R.T. unit No. 57, which was equipped with a Godward gas generator and manifold and run on fuel oil.

"The engine was started on this fuel and ran well with ample power and acceleration for all conditions of traffic and grades encountered. The operation of the engine could not be distinguished from that of similar motor coaches on the street running on gasoline.

"We tested this engine on a water barrel and the generator delivered 44.3 kw. which was substantially the same output as obtained from the engine and generator of unit No. 36, which was operated on gasoline and delivered 43.8 kw. The carburetor air valve of unit No. 36 was in the normal position for winter running and the power output of both units was measured at wide-open throttle and at 1,600 r.p.m., which is the average operating speed. Unit No. 36 has standard factory equipment, while No. 57 was equipped with the Godward fuel-oil type gas generator.

"We felt that a comparison of the performance of two different power units, running on different equipments, would not furnish data from which it would be possible to draw dependable conclusions, so we suggested that the performance of a single unit be determined with the different fuels and types of equipment. Accordingly, we returned to Philadelphia and ran a series of tests on December 27, 28 and 29.

"The motor coach furnished for this series of tests was No. 68, which was of the same type as units Nos. 36 and 57. As turned over to us for test, it was equipped as it came from the factory with a Zenith carburetor, which had a No. 29 Venturi, a No. 24 main jet, a No. 22 compensating jet and a No. 55 idling jet. The power unit of this coach delivered as much as 49.4 kw. at 1,600 r.p.m. on gasoline—specific gravity 0.764 at 15 deg. C—and the exhaust-gas analyses showed a carbon monoxide content as low as 3.1 per cent under this condition and a carbon monoxide content as low as 7.3 per cent on idling. The complete exhaust gas analyses were as follows:

	CO ₂ Per cent	O ₂ Per cent	CO Per cent
Wide-open throttle at 1,600 r.p.m.....	12.3	0.5	3.1
When idling at 380 r.p.m.....	6.4	4.4	7.3

"We consider this an unusually good performance as far as carbon-monoxide content is concerned, particularly under full power. The engine compression in pounds per square inch at cranking speed was: cylinder No. 1, 73; cylinder No. 2, 70; cylinder No. 3, 75; cylinder No. 4, 73; cylinder No. 5, 75; cylinder No. 6, 75. The standard manifolds were removed and replaced by the Godward equipment. The same carburetor was used and the unit operated under the same conditions. The power output was found to be a little less (3.85 per cent) than with the same carburetor setting and standard manifolds, because of the damping effect of the Godward equipment on the carburetor jets. The exhaust gas analyses, however, under those conditions, gave the following results:

	CO ₂ Per cent	O ₂ Per cent	CO Per cent
Wide-open throttle at 1,600 r.p.m.....	13.6	0.4	1.4
On idling at 380 r.p.m.....	7.0	3.8	7.6

"It was then decided to re-adjust the carburetor for equal power and best results as to carbon monoxide content with the Godward equipment, with the following results. Outputs of 49.4 kw. and 50 kw., respectively were obtained with the following carburetor jetting on two successive runs, the second being a check on the first. Venturi No. 31, main jet No. 28, compensating jet No. 24 and idling jet No. 40. Reducing the idling jet to No. 40, the smallest obtainable, resulted in a carbon monoxide content of 6.4 per cent under idling conditions. This size jet is considered, by the manufacturer, as entirely too small for this size engine and yet we found it necessary to enlarge the holes in the idling needle valve seat to $\frac{1}{8}$ in. in diameter in order to obtain the idling mixture producing the minimum carbon monoxide content.

"After these changes were completed, we not only obtained this power, but the following exhaust gas analyses as well:

	CO ₂ Per cent	O ₂ Per cent	CO Per cent
Wide-open throttle at 1,600 r.p.m.....	13.8	0.2	1.0
	13.8	0.6	1.1
On idling at 380 r.p.m.....	10.2	5.8	0.2
	10.2	6.2	0.3

"The engine was then operated on 42 Baumé fuel oil—specific gravity 0.814. With this fuel, the power unit delivered as much as 47.5 kw. at 1,600 r.p.m. wide-open throttle with the carburetor setting of Venturi No. 33, main jet No. 29, compensating jet No. 28, idling jet No. 40 with the idling needle valve seat enlarged $\frac{1}{8}$ in. in diameter. The exhaust gas analyses under these conditions resulted as follows:

	CO ₂ Per cent	O ₂ Per cent	CO Per cent
Wide-open throttle at 1,600 r.p.m.....	12.6	0.3	2.5
	12.6	0.2	2.4

"Idling at 380 r.p.m., with two different idling needle-valve settings, we obtained the following:

CO ₂ Per cent	O ₂ Per cent	CO Per cent
9.7	7.0	zero
10.4	5.6	zero

"It must not be assumed from these results that any needle-valve setting will give low carbon monoxide content on idling. For instance, with one particular needle-valve setting, we obtained as much as 2.9 per cent carbon monoxide. This, however, was the highest value of carbon monoxide obtained with fuel oil on idling.

"From the various runs made under the different conditions described, we are convinced that it is practicable to operate motor coaches on either gasoline or fuel oil with the Godward equipment and Zenith carburetor and secure a carbon monoxide content of the exhaust gases of less than three per cent under your conditions of operation."

A. SCHRADER'S SON, INC., Brooklyn, N. Y., manufacturers of automobile tire valves and accessories, have entered the radio advertising field with a weekly program broadcast each Friday evening over the National Broadcasting Company's Red network of 20 stations. The programs feature the Schrader-town Brass Band.

Lang Builds All-Metal Parlor-Car Body

THE Lang Body Company, Cleveland, Ohio, is now in production on an all-metal parlor-car body the outstanding feature of which is light weight and strength. New features of design have permitted the incorporation of details that contribute to greater utility of space and convenience in maintenance. A



The Interior Provides Seating Comfort and Plenty of Storage Space for Baggage

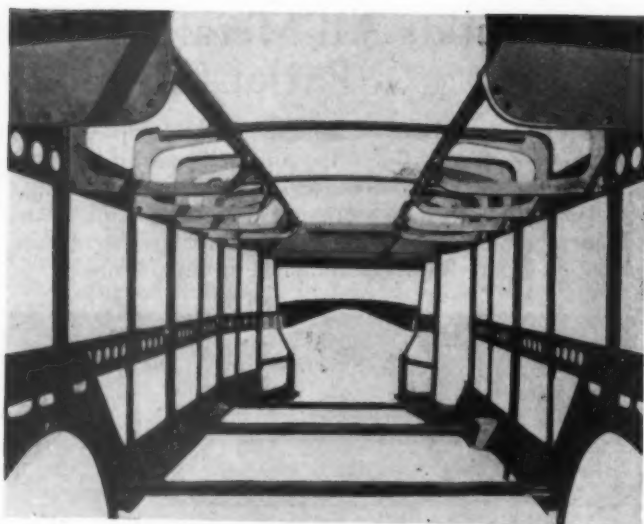
brief announcement of the development of this type of body was published in the *Motor Transport Section* for September 22, 1928, at which time complete information on the details of design and construction included here were not available.

Body Constructed in Three Unit Sections

The body is constructed in three unit sections. The sides, rear section and the floor are fabricated as a unit and the front end and the roof comprise separate units. The main body framing, consisting of the side sills, bottom rub rails, side posts and roof rail, is made up of



The Lang 29-Passenger All-Metal Body on a White Chassis



Looking at the Framing from Inside—The Baggage Racks Add to the Stiffness of the Roof

pressed steel shapes; the front quarter posts are made of $1\frac{1}{8}$ -in. square steel tubing. The side sills form the backbone of the body. They are so designed that they form the connection to the side outriggers of the chassis and serve to provide vertical stiffness to the body, to the side members of which they are riveted. The rubber rail at the bottom of the body is flanged to form the fastening for the bottom edge of the body side panels. The side posts are flanged below the belt rail and above the window header to form the connection for the roof rail and the inside lining. The belt rail is in one piece and extends from body corner post to body corner post.

Roof Design

The roof rail is of pressed steel and the inside rail is so designed that the roof can be built separately from the body. The flanges of this rail form the connections to the posts and for the rafters, with reinforcing gussets at each rafter.

At the rear wheels, where the continuity of the side sills must necessarily be broken, a special steel plate shape is riveted to the side sill and to the posts to provide the strength at this point. At the front section of the body steel angles, the steel tubing quarter posts and aluminum castings form the framework which is securely riveted to the side sills and letterboard. Cross

members are riveted above and below the windshield opening and one at the top provides the opening for the sign box.

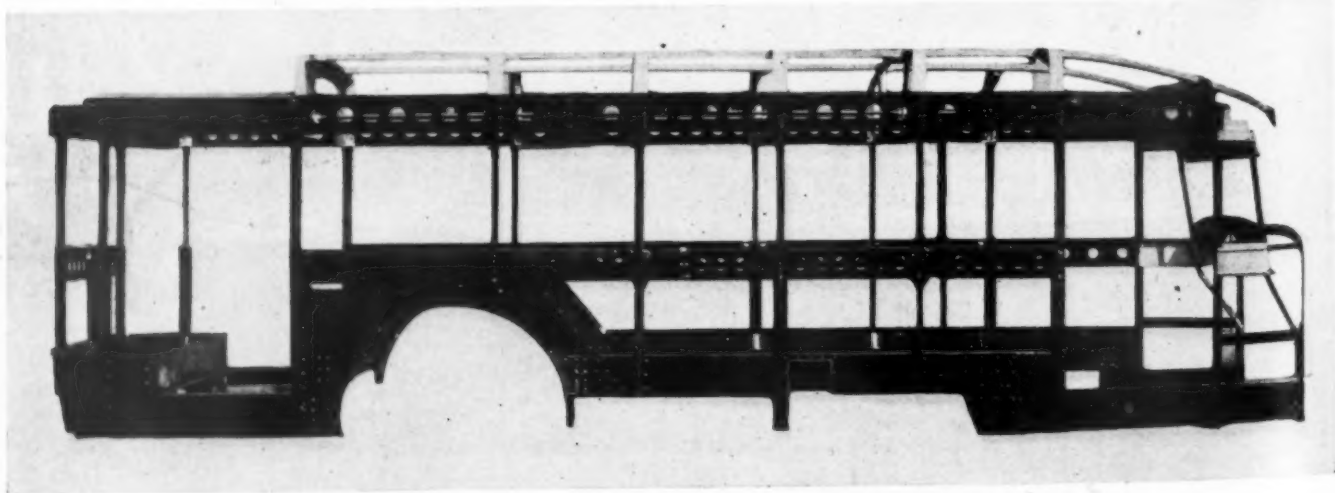
Outside Body Paneling a Feature

A special feature of this body design is the outside body paneling. The panels are made of No. 14 gage aluminum. They are fitted to the body shape and fastened to the framing with a special panel fastener which permits the individual panels to be removed and replaced in case of damage.

The windshield consists of a single stationary glass set in rubber and the front quarter shields are arranged in aluminum frames to swing out. The side windows are set in satin finished nicked brass sash arranged so that they run in felt channels and drop into a pocket in the side of the body. Stops are provided at the window posts to allow the windows to be dropped in steps of three inches. All of the windows are movable except those over the wheel housing and all movable windows are equipped with anti-rattlers, inside and outside. The rear window is Protex glass set in rubber. The rear corner windows are of the same material and are bent to the shape of the body. The main entrance door at the right front is hung on four steel hinges and is provided with a heavy-duty dovetail and three rubber door bumpers to make the door rattleproof. The rear emergency door is the same as the front door except that it is equipped with a three-point bar lock.

As shown in one of the illustrations, the interior baggage rack is formed of several aluminum castings which are riveted to the side posts and to the rafters and thereby serve to add stiffness to that section of the body. The steel-tube rail running the length of the rack serves as a grab rail and to it leather straps are attached which prevent luggage from falling out the rack.

THE GREAT WESTERN RAILWAY and the National Omnibus & Transport Company of Great Britain are organizing a new company to be capitalized at \$5,000,000, and jointly owned, for the purpose of taking over all highway passenger services now operated by these two transportation agencies in the west of England, according to recent press reports from London. A similar merger has been effected in Sheffield, England, where the city corporation has joined its motor vehicle services with those of the railways in the city and surrounding suburban territory.



A Side View of the All-Metal Frame—The Method of Construction Is Clearly Shown

Organizing a Motor Coach Subsidiary

Practices of eight roads described—Larger operations require own forces, smaller do not

IN examining the organizations of some of the leading railway motor coach operators, one fact is readily apparent, with respect to the degree of co-operation between the parent railway and the subsidiary motor coach company in the administration and performance of the work connected with the coach operation. It is that the smaller motor coach operation can be supervised and certain duties can be taken over readily by officers and employees of the railway, whose time is thus divided between the railway and the subsidiary. On the other hand, as the motor coach operation becomes larger, it becomes more necessary to give the subsidiary its individual organization in most, if not all, departments.

Even some of the smaller operations have an officer or two and a number of employees whose duties are solely in connection with the operation of the motor coach line or lines; and even in the case of some of the largest motor coach operations, such work as accounting, traffic development, etc., is still delegated to and carried on by the appropriate departments of the parent railway company. The New England Transportation Company is a good example of a motor coach operating subsidiary of a railway which has an almost completely separate organization, and the same applies to a considerable extent to the Southern Pacific Motor Transport Company, the Santa Fe Transportation Company, the Reading Transportation Company and the Boston & Maine Transportation Company. On the other hand, such motor coach operating subsidiaries as the Canadian Pacific Transport Company, the Norfolk Southern Bus Corporation and the Rutland Transportation Corporation are managed and operated to a major extent by officers and employees of the railway companies.

Following is a description of the organizations of the eight railway motor coach operating companies mentioned, together with statistics as to the extent of their operations.

New England Transportation Company

The New England Transportation Company has four executive officers, a president, a vice-president in charge of purchases and supplies, a vice-president in charge of legal matters, and a treasurer. These are the only officers or employees of the transportation company who are also connected with the New York, New Haven & Hartford, the parent railway company. The president of the transportation company is also a vice-president of the New Haven; the vice-president in charge of purchases and supplies is also vice-president in the same capacity of the New Haven; the vice-president in charge of legal matters is counsel for the New Haven for the state of Rhode Island; and the treasurer of the transportation company acts also as the New Haven treasurer's agent at Boston. The auditor of the transportation company is also auditor of the Boston Terminal Company and the Union Freight Railroad Company, subsidiaries of the New Haven.

The traffic manager, auditor, treasurer and general manager are the general officers and report directly to the president and vice-presidents. The traffic manager has charge of traffic surveys, rates, tickets, passenger terminals, etc. There are also an assistant to the traffic manager, and general agents in principal cities served by the motor coaches, who have jurisdiction over traffic matters in their immediate territories. In general charge of transportation is the general manager, who has jurisdiction over operation, including the maintenance of equipment and garages. Under the general manager is the general superintendent, who has jurisdiction over transportation matters and who reports to the general manager. At the head of the mechanical department is the mechanical superintendent who has jurisdiction over all mechanical matters, including equipment and garages. The only other general officer is the auditor in charge of the accounting department.

Four Operating Divisions

The New England Transportation Company has four operating divisions, each in charge of a division superintendent who reports directly to the general superintendent. In addition, there is on each division, an assistant superintendent in charge of the superintendent's office, a general supervisor in charge of supervisors, and a transportation foreman who is in charge of the handling of operators and equipment as needed, in the capacity of a dispatcher covering the operation of each division. There are several supervisors on each division who have charge of large terminals or one route or more in accordance with the importance of the routes; starters, who have charge of terminal operation, handling coaches and operators involved in the service in and out of the terminal; and the motor coach operators themselves.

The divisional organization of the mechanical department under the mechanical superintendent includes a mechanical inspector on each division who has charge of maintenance on that division and reports to the mechanical superintendent. The position of mechanical inspector is similar to that of master mechanic on a railroad division. A shop foreman and an assistant shop foreman have charge of maintenance and the back shop, and working foremen have charge of outlying terminals covering the maintenance of equipment which ties up overnight at such points. Other mechanical department employees include terminal inspectors, a master engine builder, a master body worker, a master painter, mechanics, washers and greasers.

The traffic department includes, in addition to the general officers mentioned, a large number of ticket agents and ticket clerks; and the accounting department is supervised, under the direction of the auditor, by a chief clerk and traveling coach auditors, who check the revenue of coaches periodically while en-route. The stores department is represented by a storekeeper on each division.

The New England Transportation Company is now

operating 270 motor coaches and averaging 25,000 coach miles per day.

Southern Pacific Motor Transport Company

On August 31, a total of 90 motor coaches were being operated by the Southern Pacific Motor Transport Company, these covering 1,147 motor coach miles daily. There have been considerable increases in both of these figures since that date. Its officers include a president, a vice-president and a manager, an auditor, a treasurer, a secretary and two superintendents. All of the officers, with the exception of the vice-president and manager and the two superintendents, are officers also of the Southern Pacific Company.

The motor transport company, at the present time, is maintained almost solely as an operating organization, such work in connection with its business as traffic, accounting, storekeeping, etc., being handled by the appropriate departments of the railway. The motor transport company has 15 employees in the general office, including the office of the superintendent at Salem. It also has 19 employees with varying duties of a supervisory nature, 91 motor coach drivers and 35 mechanics and other employees in the maintenance department.

Canadian Pacific Transport Company

The Canadian Pacific Transport Company operates three motor coaches, two of these being in regular daily service, covering 366 miles per day. The operation of the transport company, which is a subsidiary of the Canadian Pacific railway, is under the jurisdiction of the Grand River railway, this also being a subsidiary of the Canadian Pacific. Officers and employees of the Grand River railway carry on virtually all of the work of managing and operating the subsidiary. The general manager, the superintendent, the assistant superintendent, the general accountant, the general freight and passenger agent, the master mechanic, the electrician, the coach mechanic and the foreman painter of the Grand River railway have charge also of the similar work for the subsidiary company.

Santa Fe Transportation Company

The Santa Fe Transportation Company, under Fred Harvey management, has no officers or employees who are connected with the Santa Fe. The general office is in charge of the resident director and a superintendent. The operating department includes the assistant superintendent, the dispatcher, the supervisor of equipment, a number of coach and automobile drivers, and garage service men. The maintenance department includes a shop foreman, mechanics and mechanics' helpers, car washers, a stock clerk, painters and a tire man. The Santa Fe Transportation Company is operating approximately fifty motor coaches and automobiles, with a daily mileage of approximately two thousand three hundred.

Reading Transportation Company

The Reading Transportation Company, which is operating 30 motor coaches with an average daily mileage at this time of 2,469 miles, has its own organization for operation and maintenance matters, but depends upon the parent railway company for the carrying on of the work of other departments. In general charge of the transportation company is the manager, who is also passenger traffic manager of the Reading. The superintendent of the transportation company, who is also superintendent of highway transportation of the Reading, is in direct charge of the motor coach

operation. Under the superintendent are an assistant superintendent in charge of maintenance, and an inspector.

The maintenance department includes a supervisor at each of the two garages maintained by the transportation company, four mechanics and four helpers. The Reading employs 27 motor coach operators at this time.

Norfolk Southern Bus Corporation

The Norfolk Southern Bus Corporation is operating five motor coaches with an average mileage of approximately twenty thousand per month. Its operations are supervised entirely by officers of the railway. The bus corporation has a president, a general manager, a master mechanic, a secretary, a treasurer and a general auditor, all of whom are officers of the railroad, only a small portion of their time being needed by the motor coach operation. As its own employees, the Norfolk Southern Bus Corporation has several drivers but no mechanics, since maintenance work is carried on in the shops of the railway.

Rutland Transportation Corporation

Like the Norfolk Southern motor coach subsidiary, the Rutland Transportation Corporation, which operates two motor coaches and covers 136 motor coach miles daily except Sunday, is supervised entirely by officers of the railway. It has a general manager, an acting auditor, a general attorney, a general freight and passenger agent, an assistant general passenger agent, a general superintendent and chief engineer, a superintendent, a purchasing agent, a superintendent of motive power and rolling stock and a claim agent, all of whom hold similar positions with the Rutland railroad. Maintenance work is carried on in the railroad shops.

Boston & Maine Transportation Company

The Boston & Maine Transportation Company has its own organization separate from that of the railway to carry on most of its work, except in connection with accounting and financial matters. The president of the transportation company is also passenger traffic manager of the Boston & Maine, the treasurer is assistant treasurer of the railway, and the controller is controller also of the parent company. All accounting is handled by the accounting department of the railway, the expenses incurred being billed against the transportation company.

The motor coach service is under the general supervision of the manager. To assist him in the general office is an assistant to the manager, a chief clerk and other clerical employees. There are three operating divisions, each in charge of a division superintendent, under each of whom is a chief clerk, a clerk, inspectors and motor coach operators. The mechanical department is in general charge of the mechanical superintendent, who has a chief clerk and several clerks to assist him. The garages are in charge of a general foreman, and a garage foreman, at each garage. The employees include storekeepers, mechanics, helpers and cleaners. The all-expense tours operated by the transportation company during the summer have a special representative in charge, a solicitor, tour conductors and a clerk. The company is now operating 92 motor coaches, although it had 112 in operation during the summer months, 20 additional coaches being leased. The daily average motor coach mileage is 6,348, the maximum having been 9,400 miles during the month of August.

New Interstate Regulation Bill

H. R. 15621 introduced by Congressman Parker following agreement of interested parties

A NEW bill, designated as H. R. 15621, "to regulate interstate commerce by motor vehicles operating as common carriers of persons on the public highways," has been introduced in Congress, and referred to the Committee on Interstate and Foreign Commerce. This bill is understood to have the approval of various interested organizations, including the Association of Railway Executives, the American Electric Railway Association, the American Automobile Association, the National Automobile Chamber of Commerce and the Association of Utilities Commissioners.

For some time past, these organizations have declared themselves in favor of the principles of regulation of interstate common carrier motor coaches, but, as indicated in hearings on previous proposed legislation of this sort, they were not all in agreement as to the exact character of such regulation and the form of its administration. These differences were threshed out during a series of conferences last December, and the new Parker bill is the outcome.

Differs from Previous Bills

The new Parker bill is markedly different from a bill having the same purpose introduced by Representative Parker in March, 1928, and designated as H.R. 12380, and differs still more from another bill introduced by Representative Parker at the opening of the present Congress a year ago. That bill provided for the regulation of both motor coaches and motor trucks, and among its most important provisions were those which declared that operation of an interstate line prior to the enactment of the law would not be considered grounds for automatically granting a certificate permitting the continuation of such operations, and that consideration in action upon applications for certificates must be given to the effect of the operation on existing carriers.

The next Parker bill, H.R. 12380, had the approval of the various interested organizations, with the exception of the National Automobile Chamber of Commerce, and was much less drastic in its provisions than the one introduced two months earlier by Congressman Parker. Briefly, this bill provided for the administration of the regulatory provisions of the proposed law by the local public service commissions of the various states, or by joint boards made up of representatives from the commissions of two or more states. Provision was made for appeal to the Interstate Commerce Commission in the event of disagreement among the representatives on the proposed joint boards. The bill also provided that carriers in bona fide operation at least one year prior to the opening date of the legislative session at which the bill should be passed and thence until the time of application for a certificate, should be automatically granted authority to continue operations.

In hearings on this bill, it was claimed by some of the interests that the administration of the law would be too unwieldy. At the same hearings, the railways requested an amendment to the bill to permit them to own and operate motor coach lines, and thus make it possible for them to substitute motor coach service for passenger train service, by relieving them from the operation of the "anti-trust laws" in such cases. An

appropriate amendment to the second Parker bill, proposed by R. N. Van Doren, vice-president and general counsel of the Chicago & North Western, and chairman of the law committee of the Association of Railway Executives, has been included almost verbatim in the new Parker bill.

It was contended at the previous hearings by Alfred P. Thom, Jr., general solicitor of the Association of Railway Executives, that any proposed regulatory legislation should provide that consideration be given, in action upon applications for certificates, to the effect which a proposed motor coach operation would have on existing transportation agencies. At hearings during April, 1928, Mr. Thom said that the railroads do not contend that the mere existence of a competing rail line should be sufficient grounds to justify the denial of an application to operate a motor coach line, but that "the effect of the proposed motor coach operation upon the ability of the rail carrier to furnish service essential to the public is a proper and just matter for the regulatory body to consider." No provision of this sort is contained in the new Parker bill, however.

Provisions of New Parker Bill

The new Parker bill provides for a simpler method of administration of the regulation of interstate motor coach lines, and provides for a minimum of regulation, but it contains several points which are considered to be of vital interest to the railways. Section 1 contains the definitions of the various terms used in the bill. A "motor vehicle" is defined as including "all vehicles or machines propelled by any power other than muscular power and used upon the public highways for the transportation of persons, except that the same shall not include any vehicle, locomotive or car operated on rails, or motor vehicles used exclusively in the transportation of property." The term "motor carrier" is defined as meaning and including any carrier of persons which "holds out, announces, or advertises the operation of motor vehicles for compensation in interstate commerce, or which operates or runs motor vehicles over any street, highway, or public place in interstate commerce, and accepts and discharges such persons as may offer themselves for transportation, either at a terminus or points along the way or route on which such motor vehicles are used or operated or may be running." Motor coaches used for the transportation of school children, taxicabs having a capacity of six passengers or less, not operated on a regular route, or coaches owned or operated by or for hotels and used exclusively for hotel patrons, are not considered motor carriers under the terms of the bill.

The administration of the provisions of the bill is made the duty of the Interstate Commerce Commission and of joint boards to be created under the bill's provisions, acting as federal agencies. All powers granted in the Interstate Commerce Act to the Interstate Commerce Commission are extended to it for the purpose of the enforcement of the present bill, and it is provided that the commission may adopt uniform rules for the regulation of motor carriers and such rules and regulations as may be necessary for the proper admin-

istration or enforcement of the act. The second paragraph of this section of the bill provides that nothing contained in Section 500 of the Transportation Act "shall be construed by any joint board, by the commission or by any court to express a policy of Congress in favor of any other form of transportation as against transportation by motor vehicle, or to affect in any manner the issuance of a certificate under this act, if the issue of such certificate after all pertinent facts and circumstances have been duly considered on their merits, is deemed proper in the public interest." Section 500 of the Transportation Act is that section which calls for the promotion of transportation on waterways. The second paragraph of this section also states that "Nothing herein contained shall be construed as a declaration by Congress of the relative importance to the public of the several kinds of transportation."

For the purpose of carrying out the provisions of the act, the commission is ordered to refer all matters over which it has jurisdiction under the terms of the bill to joint boards, made up in each case of representatives of the boards or regulatory bodies of the various states in which any part of the interstate operation is, or is proposed to be, conducted. On the joint boards there would be one representative from each of such states, to be designated by the board in the state either from its own membership or staff, or from the membership or staff of any other board interested in the proceedings. Provision is also made that if there is no regulatory body in any state affected, or if one fails to designate representatives to act on a joint board, the joint board shall function without a representative from such state or states. It is also provided that if all the states affected by a proposed interstate operation fail to designate representatives to a joint board, the Interstate Commerce Commission shall hear the application and act upon it. The other provisions of Section 2 relate to the duties of the joint boards.

The "Grandfather Clause"

Section 3 of the new Parker bill is concerned with certificates of public convenience and necessity. It provides that no corporation or person shall engage as a motor carrier in interstate commerce without having first obtained from the commission a certificate of public convenience and necessity authorizing such operation. It is provided, however, that motor carriers in operation on the date of the approval of the bill shall have 90 days from such date in which to file applications for certificates under its provisions, and shall have the right to continue in operation until their applications have been finally decided. The "grandfather clause" in the bill reads as follows: "Provided further, that if a motor carrier, or its predecessors in interest, was in bona fide operation over any route on November 1, 1928, and (except as to seasonal service or interruptions of operations over which the applicant or a predecessor in interest had no control) continuously has been so operating since that date, and such motor carrier shall make application to the commission for a certificate of public convenience and necessity, it shall be served by the commission with a questionnaire in respect to the matters which, in the judgment of the commission, shall constitute bona fides of operation, which questionnaire the applicant shall answer within 90 days from the receipt thereof; and, if it appears from the answers to such questionnaire or from information furnished by any board that the operations of such applicant are bona fide for the purpose of furnishing transportation to the public and of continuing the same for

a reasonable period, a certificate shall be issued to such applicant as a matter of course; but if, from the answers to such questionnaire or from information furnished by a board, the commission shall not be satisfied of such bona fides, it shall refer such matter to a joint board for a decision."

Section 4 describes the ways in which applications are to be made, stating that these must be forwarded in writing to the Interstate Commerce Commission. Section 5 relates to hearings on applications and in the second paragraph provides, as follows: "In determining whether or not a certificate should be issued, the joint board and the commission shall, among other pertinent matters, give reasonable consideration to the convenience of and necessity to the public to be served thereby, of the service by motor vehicle applied for, and to existing available transportation agencies and service."

Section 6 relates to the granting of certificates and provides in its second paragraph that any motor carrier holding a certificate under this act may operate chartered motor vehicles in interstate commerce or may occasionally depart from its regular route for the purpose of providing special service to a point beyond such route, according to such rules and regulations as the commission may prescribe. The transfer of certificates is covered in Section 7, and Section 8 provides that holders of certificates must comply with such rules and regulations as the commission may adopt governing the filing of bonds, policies and insurance, or other security for the protection of the public. The commission is granted the power to permit self-insurance whenever, the financial ability of the motor carrier warrants.

Rates

Section 9 of the bill covers the matter of rates, requiring that they shall be just and reasonable and that tariffs shall be prepared and posted in such manner as may be prescribed by the commission. It is provided that no motor carriers shall charge a greater or less compensation than that specified in the tariffs in effect at the time; with a 30-day notice of proposed change.

Section 10 provides for the filing of appeals to the Interstate Commerce Commission from the decisions of joint boards. Section 11 is devoted to orders and notices, and Section 12 to penalties for unlawful operation. Section 13 provides for appropriations of such sums as may be necessary to be paid to the commission and held by it as a separate contingent fund, out of which it may meet the expenses of the administration of the act incurred by the commission or joint boards.

Section 14 declares that nothing in the act shall be construed to affect the powers of taxation of the states or to authorize a motor carrier to do an intrastate business on the highways of any state. The right of the states to regulate intrastate carriers in accordance with their own laws is affirmed.

Railway Operation of Motor Coaches Approved

Section 15 is of particular interstate to the railways since it is along the line of the amendment to the previous Parker bill, proposed by Mr. Van Doren. It provides that "any corporation, which shall engage in the transportation of passengers by motor vehicle, or which shall own or control a motor carrier which operates such motor vehicles, or which shall purchase and own the whole or any part of the capital stock of a corporation organized or engaged as a motor carrier in interstate commerce, and for the operation of which motor vehicles a certificate of public convenience and necessity

has been obtained, shall be relieved from the operation of the 'anti-trust laws', . . . and of all other restraints or prohibitions by any law, state or federal, insofar as may be necessary to enable it to own, control and operate, either directly or through a subsidiary corporation, such motor vehicles upon the public highways for the transportation of persons, property or mail."

Commission Suggests Changes

In a letter addressed to Congressman Parker, Frank McManamy, chairman of the Interstate Commerce Commission's legislative committee has suggested some changes in the bill to clarify it. An abstract of the commission's suggestions follows:

Section 2. This section, which makes it the duty of the commission and of the joint boards to administer the provisions of the act, when read together with section 9 (a), which requires that rates be just and reasonable, might possibly be interpreted as contemplating proceedings wherein the reasonableness of rates would be passed upon. It is probable that no such proceedings are intended, but we suggest that language be incorporated that would remove any possible doubt.

Section 2 (d). We suggest that this paragraph be clarified in respect of the question as to whether the time limitation for issuing certificates and that for noting appeals date from the time notice is actually received by a party, or whether, in cases where notice is mailed, as provided for in section 11, such limitations would date from time of mailing.

Section 2 (e). It is not stated whether unanimous vote upon a decision is required or whether a majority vote is enough. It may be that this matter is intended to be cared for in the rules to be promulgated by the commission pursuant to section 2 (a), but it is an important matter which we feel should be called to your attention.

Section 5 (b). The question as to whether public convenience and necessity require the operation of a motor passenger line between points already adequately served, insofar as steam railroads or street or interurban electric railways are fitted to render adequate service, involves what are to us entirely new principles. In view of the direction that reasonable consideration shall be given to existing available transportation agencies and service, a construction could be adopted which would exclude motor competition in a field already enjoying good railroad or electric railway service.

On the other hand, although motor coaches ordinarily have fixed stations in towns or cities, they stop to pick up passengers at almost any point along their route. Because of the dissimilarity between this service and railroad service and the comparatively small investment entailed in the operation of the motor coach lines, the adoption of applicable basic principles will involve the exercise of a very broad discretion. It is highly desirable that Congress should give the most specific direction which it can as to the matter in which the discretion is to be exercised.

Section 12 (b). As noted above, section 9 (a) requires that rates be just and reasonable and, apparently, the bill does not intend to provide for proceedings before the joint boards of the commission to pass on the question of reasonableness of rates. Accordingly, if a bill were to be brought in court to enjoin a motor carrier from charging rates alleged to be in violation of section 9 (a), it would seem to devolve upon the court to determine as an original matter whether or not the rates were reasonable. This should be considered with what was said above regarding section 2.

Motor Transport News

THE THORNTON & ALEXANDRIA has applied to the Arkansas Railroad Commission for permission to operate motor coaches paralleling its railway line between Hampton, Ark., and Tinsman, a distance of 12 miles.

CO-ORDINATED service between air and highway carriers is planned by British motor coach and airway operators, according to recent news dispatches from London. It is planned to co-ordinate an air and highway movement of both freight and passenger traffic.

THE IOWA BOARD OF RAILROAD COMMISSIONERS has granted permission to the Chicago, Milwaukee, St. Paul & Pacific to replace passenger train service with motor coach service between Rockwell City, Iowa, and Storm Lake. This is believed to be the first instance in which a steam railway has proposed motor coach operations in the state of Iowa.

THE SOUTHERN PACIFIC MOTOR TRANSPORT COMPANY has applied to the Texas Railroad Commission for a permit covering that portion of its route, between Los Angeles, Cal., and El Paso, Texas, which lies in the state of Texas, and over which the Texas commission has jurisdiction. The commission held a hearing on the application on January 21.

THE SEABOARD AIR LINE, through its highway subsidiary, the Motor Transportation Company, of the South, on January 1, established motor coach service between Tampa and New Port Richey, Fla. The highway schedules will co-ordinate with Seaboard train schedules at Tampa and will also provide motor coach service to points between Tampa and New Port Richey. Arrangements for baggage handling and ticket interchange will be the same as on the Jacksonville-Tallahassee motor coach run of the company, which was described in the *Motor Transport Section* of December 22, 1928, page 1271.

Mo. P. Extends Highway Operations To Rio Grande Valley

The Texas Railroad Commission has approved the application of the Missouri Pacific Transportation Company to purchase three motor coach lines operating in the lower Rio Grande valley. In its application the Missouri Pacific Transportation Company proposed to take over the Black Diamond line operating between Brownsville, Texas, and Mission, and the lines of C. A. Neitert and Glenn Milam, who hold certificates covering the route between Brownsville and Point Isabel. The commission has given its approval and the purchase has been consummated.

Pacific Great Eastern Offers Motor Coach Service

The Pacific Great Eastern has temporarily replaced passenger train service between North Vancouver, B. C., and Whytecliff, with motor coach service, the coaches operating on the train schedules and passengers being charged at the rates for transportation on the trains. Press reports state that officers of the railway estimate the motor coaches are carrying more passengers than were carried by the trains. It is understood that the Pacific Great Eastern does not intend to continue the motor coach permanently, but expects to maintain it only while difficulties connected with the North Shore train service are being adjusted. Consideration is being given to the permanent abandonment of the North Shore branch of the railway.

Motor Transport Division to Meet February 26-March 1

The next meeting of the Motor Transport Division of the American Railway Association will be held in the new Hotel Jefferson, St. Louis, Mo., from February 26 to March 1, inclusive. The sessions of February 26, 27 and 28, will be devoted to the consideration of the reports of the committees of the motor coach, motor truck and rail motor car sections of the division. On March 1, the session has been set aside for a

joint conference with representatives of the automotive industry and of other motor vehicle operating organizations. The first day's session will convene at 10 a.m.

It is pointed out by the general committee that attendance at the meeting is not confined to the voting representatives of the division. The general committee hopes, therefore, that in addition to its voting representatives each member road will send to the meeting such other officers as are interested in the several phases of the work of the division. A meeting of the general committee will be held in the evening of February 25.

Further Motor Coach Service on S. P.

Substitution of motor coaches for a number of local branch line passenger trains in the Monterey-Salinas-Santa Cruz section of California was made by the Southern Pacific Motor Transport Company on January 15. The change was authorized by the Railroad Commission of California in approving the Southern Pacific's application to discontinue these unprofitable trains. According to the railway, a more flexible and convenient service will be given by the motor coaches. Operation of the new motor coach service in co-ordination with rail service will be on regular daily schedules between Del Monte Junction and Salinas, Pacific Grove and Del Monte Junction, Santa Cruz and Watsonville Junction, and Santa Cruz and Davenport.

Highway Operations in Washington

Motor vehicle operators in the state of Washington reported aggregate operating revenues of \$6,482,746.69 for the year 1927 to the Department of Public Works. Of this amount, \$4,190,802.53 was derived from passenger, express, baggage, mail and other traffic handled in motor coaches, while \$2,291,944.36 was derived from the freight traffic carried in motor trucks. Total revenues exceeded those of 1926 by \$319,044.85. The motor coach lines showed an aggregate net operating income of \$305,823.95 for 1927, as compared with a net operating income in 1926 of \$296,067.97. The motor truck operators reported net operating income of \$44,228.90 in 1927, a decrease as compared with the performance in 1926 when the net operating income of the truck lines was \$71,347.

Educational Motion Picture Film Tells Story of Gasoline Motor

"The Story of a Gasoline Motor," a new educational motion picture film, produced under the direction of the United States Bureau of Mines, Department of Commerce, in co-operation with a large industrial concern, is now ready for distribution. This three-reel film depicts all processes involved in the construction and operation of a gasoline motor.

In preparing this film, many types of automobile engines were cut apart, so that every action of the working parts of the engine could be shown graphically. During the filming of the picture, numerous large plants were visited in order that views might be shown of the actual forging of the engine parts.

Copies of this film may be obtained for purposes of exhibition from the Pittsburgh Experiment Station of the United States Bureau of Mines, Pittsburgh, Pa. No charge is made for the use of the film, but the exhibitor is asked to pay transportation costs.

Cotton Belt's Agricultural Department Uses Motor Coaches

The agricultural department of the St. Louis Southwestern has developed and is using a motor coach to transport equipment and make possible the use of loud speakers and motion picture films and slides in presenting the instruction and entertainment which are used in its program to promote modern methods of farming, dairying, etc. The coach is used at country schoolhouses, picnics, fairs and other public places and enables the railroad's representatives to reach points that are remote from railway lines. A power take-off, operated when the gear of the truck is in neutral and the engine running, drives a 125-volt direct current generator and stores the electricity in 96 Edison battery cells. A converter turns this electrical energy into 110-volt alternating current, which is used to operate a public address system, with microphone and amplifiers, a reproducer of phonograph records, a standard motion

picture machine, and to supply lights when needed. The car consists of a special body of aluminum, with the interior finished in polished wood and genuine leather, which is mounted on an International chassis. Seven passengers are accommodated in comfort. One feature is a concealed copper tube, which carries a nine-foot motion picture screen.

A metal grille, which gives the coach the appearance of a Pullman observation or private car, is hinged to form a speaker's platform, and addresses or musical numbers delivered through the microphone, or phonograph records played, are amplified through the horns in sufficient volume to be heard plainly by 5,000 people. There is also a loud speaker for use in halls, churches, or other buildings.

S. P. Acquires Control of Two Independents

The Southern Pacific Motor Transport Company has acquired control of Oregon Stages, Incorporated, and Coast Auto Lines. The three companies will operate 145 motor coaches over a system of routes paralleling most of the important Southern Pacific railway lines in Oregon and will represent the largest motor coach operation in that state. The Oregon Stages operates a line between Portland, Ore., and Ashland while the coast auto lines operate in the vicinity of Coos bay. Operations of the Oregon Stages and Coast Auto Line are to be carried on independently of those of Southern Pacific Motor Transport Company except with respect to coordination of all train and motor coach schedules.

Orders for Equipment

THE SOUTHERN PACIFIC MOTOR TRANSPORT COMPANY has received two Type-W 17-passenger parlor motor coaches from the General Motors Truck Company, Pontiac, Mich.

THE SOUTHWESTERN TRANSPORTATION COMPANY, subsidiary of the St. Louis Southwestern, has received four Type-W Yellow coaches from the General Motors Truck Company, Pontiac, Mich.

Motor Transport Officers

G. H. Winsor, formerly president of the San Benito & Rio Grande Valley, has been appointed district manager of the Missouri Pacific Transportation Company, motor coach operating subsidiary of the Missouri Pacific Lines, with headquarters at Houston, Texas.

F. H. Scofield has been appointed superintendent of the motor coach lines of the Missouri Pacific Transportation Company operating between West Plains, Mo., and Poplar Bluff and between Poplar Bluff and Bird's Point. His headquarters will be at Charleston, Mo. H. P. McDonald has been appointed superintendent of automotive equipment of the transportation company, with headquarters at St. Louis, Mo.

[The following officers of the Missouri Pacific Transportation Company, motor coach and truck operating subsidiary of the Missouri Pacific Lines, have been appointed. L. W. Baldwin, president of the Missouri Pacific is president also of the transportation company. P. J. Neff, assistant to the president of the Missouri Pacific, is also vice-president and general manager of the transportation company. F. P. Johnson, vice-president of the Missouri Pacific, has been appointed also general auditor of the transportation company. F. W. Irland, assistant secretary of the Missouri Pacific, has been appointed also secretary of the transportation company. W. J. Wright, local treasurer of the Missouri Pacific at St. Louis, Mo., has been appointed also treasurer of the transportation company. All of these officers will have their headquarters at St. Louis.

Among the Manufacturers

W. C. Stettinius has resigned as president and general manager of the American Hammered Piston Ring Company and has been succeeded by Allen W. Morton, who was promoted from the position of vice-president. Mr. Stettinius will continue to serve on the board of directors of which he is vice-chairman.